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Practical-1 Infrastructure as a service using AWS.

Writeup:-

- **Cloud Computing architecture**

Cloud computing architecture is a framework that revolutionizes the way computing resources are delivered and consumed. It is a model that allows users to access and utilize a variety of computing services over the internet. This architecture is composed of three main service models: Infrastructure as a Service (IAAS), Platform as a Service (PAAS), and Software as a Service (SAAS).

In an IaaS model, users have the ability to rent virtualized computing resources over the internet. This includes virtual machines, storage, and networking. Unlike traditional infrastructure setups, IaaS provides a flexible and scalable solution without requiring organizations to invest heavily in physical hardware. This flexibility is particularly valuable in dynamic business environments where computing needs can vary over time.

The primary advantage of cloud computing architecture, and IAAS in particular, is the ability to access computing resources on-demand. This allows organizations to scale their infrastructure up or down based on workload requirements, optimizing resource utilization and cost efficiency. Additionally, cloud architecture promotes accessibility and collaboration, as users can access computing resources from any location with internet connectivity.

As cloud computing continues to evolve, the architecture is becoming increasingly sophisticated, incorporating advanced technologies such as serverless computing, containerization, and edge computing. These innovations enhance the agility, scalability, and overall efficiency of cloud-based solutions.

- **IAAS**

Infrastructure as a Service (IAAS) is a foundational component of cloud computing that provides users with virtualized computing resources over the internet. In an IAAS model, organizations can rent infrastructure components such as virtual machines, storage, and networking, rather than investing in and maintaining physical hardware.

One of the key benefits of IAAS is its flexibility. Users have the ability to scale computing resources up or down based on demand, allowing for efficient resource utilization and cost optimization. This flexibility is particularly valuable for businesses with fluctuating

computing needs, as it eliminates the need for over-provisioning or under-provisioning hardware.

Amazon Web Services (AWS), a leading cloud services provider, offers a comprehensive IAAS solution known as Amazon Elastic Compute Cloud (EC2). EC2 allows users to launch virtual servers, known as instances, and configure them with various operating systems and applications. This service is designed to be scalable, reliable, and secure.

Security is a critical consideration in IAAS, and providers like AWS implement robust measures to ensure the protection of virtualized resources. Users can deploy their infrastructure within a Virtual Private Cloud (VPC), creating a network-isolated environment with customizable security settings.

- **AWS**

Amazon Web Services (AWS) stands as a global leader in cloud services, offering a comprehensive suite of solutions that span Infrastructure as a Service (IAAS), Platform as a Service (PAAS), and Software as a Service (SAAS). AWS provides users with on-demand access to a vast array of computing resources, eliminating the need for physical hardware and enabling businesses to run applications, store data, and perform various computing tasks in a flexible and scalable manner.

Key to the success of AWS is its commitment to providing a reliable, secure, and cost-effective cloud computing environment. The AWS global infrastructure spans multiple regions and availability zones, allowing users to deploy resources in geographically distributed data centers for enhanced reliability and redundancy.

AWS services cover a wide range of domains, including computing power, storage, databases, machine learning, analytics, security, and more. These services are designed to cater to the diverse needs of businesses and individuals, allowing them to build, deploy, and manage applications with ease.

As a pioneer in the cloud computing industry, AWS has played a significant role in shaping the digital landscape. Its pay-as-you-go pricing model, coupled with a vast selection of services, has democratized access to advanced computing capabilities, making it an attractive choice for startups, enterprises, and government organizations alike.

- **AWS services**

Amazon Web Services (AWS) offers a rich and diverse set of services, each designed to address specific computing needs and requirements. These services span multiple

domains, providing solutions for computing power, storage, databases, machine learning, analytics, security, and more. AWS services are foundational to the cloud computing experience, enabling users to build, deploy, and manage applications with ease.

Key AWS Services:

Amazon EC2 (Elastic Compute Cloud): A core Infrastructure as a Service (IAAS) offering, EC2 allows users to launch virtual servers known as instances. These instances can be configured with various operating systems and applications, providing scalable and flexible compute capacity in the cloud.
Amazon S3 (Simple Storage Service): An object storage service designed for scalable and secure storage of data. S3 allows users to store and retrieve any amount of data from anywhere on the web.
Amazon RDS (Relational Database Service): A managed database service that simplifies the setup, operation, and scaling of relational databases. RDS supports various database engines, including MySQL, PostgreSQL, and Oracle.
AWS Lambda: A serverless computing service that allows users to run code without provisioning or managing servers. It automatically scales based on the incoming request volume.
Amazon SNS (Simple Notification Service): A fully managed messaging service that enables the distribution of messages and notifications to a distributed set of recipients.
Amazon CloudWatch: A monitoring and observability service that provides data and actionable insights for AWS resources. It allows users to collect and track metrics, collect and monitor log files, and set alarms.
Amazon IAM (Identity and Access Management): A service that helps users securely control access to AWS resources. IAM allows the creation and management of AWS users and groups and helps define their permissions.

Each AWS service is designed to be scalable, reliable, and secure. The comprehensive nature of these services allows businesses to tailor their cloud infrastructure to specific needs, promoting agility and innovation in their digital endeavors.

- **EC2**

Amazon Elastic Compute Cloud (EC2) is a fundamental Infrastructure as a Service (IAAS) offering provided by Amazon Web Services (AWS). EC2 allows users to rent virtual servers, known as instances, in the cloud. These instances can be configured with various operating systems and applications, providing scalable and flexible compute capacity on-demand.

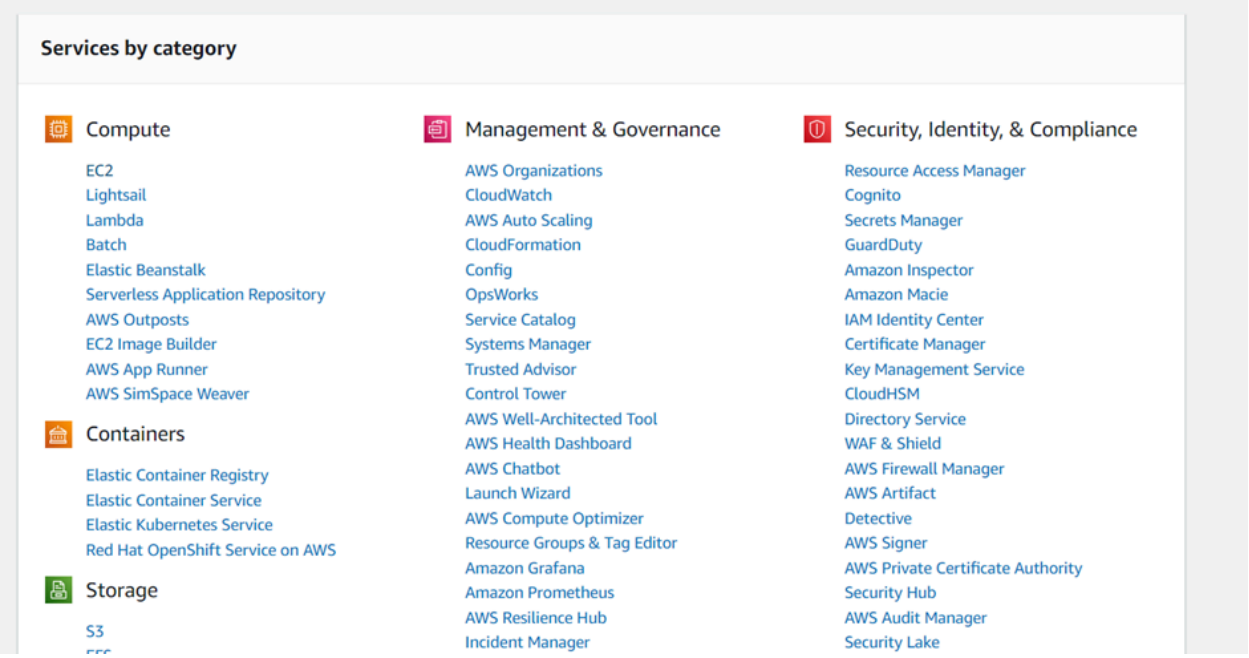
Key Features of AWS EC2:

Elasticity: EC2 instances can be easily scaled up or down based on demand. This elasticity allows users to respond dynamically to changes in computing requirements, ensuring optimal resource utilization.
Variety of Instances: EC2 provides a wide range of instance types optimized for different use cases. This includes compute-optimized instances

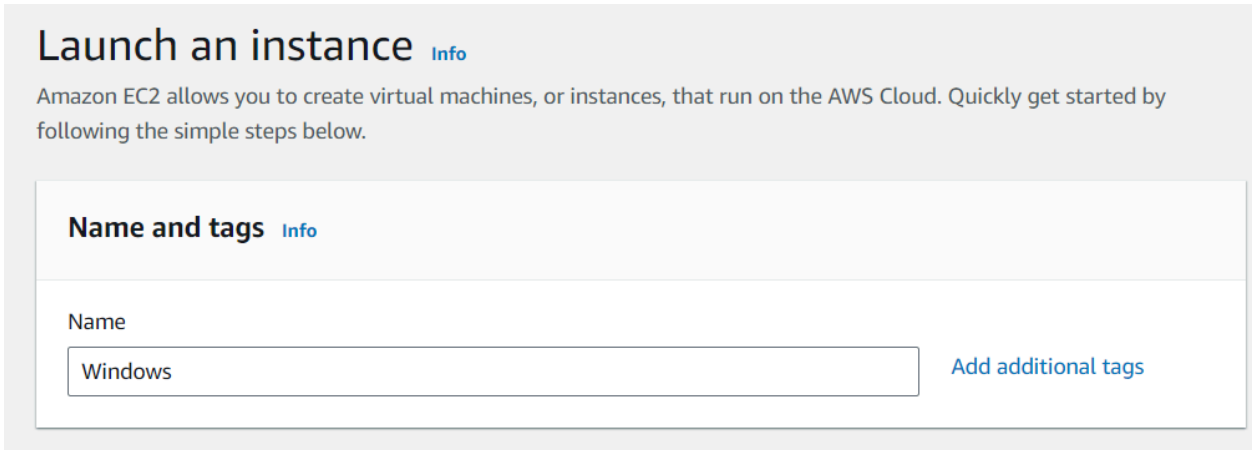
1. **Implement the windows machine using AWS ec2.**

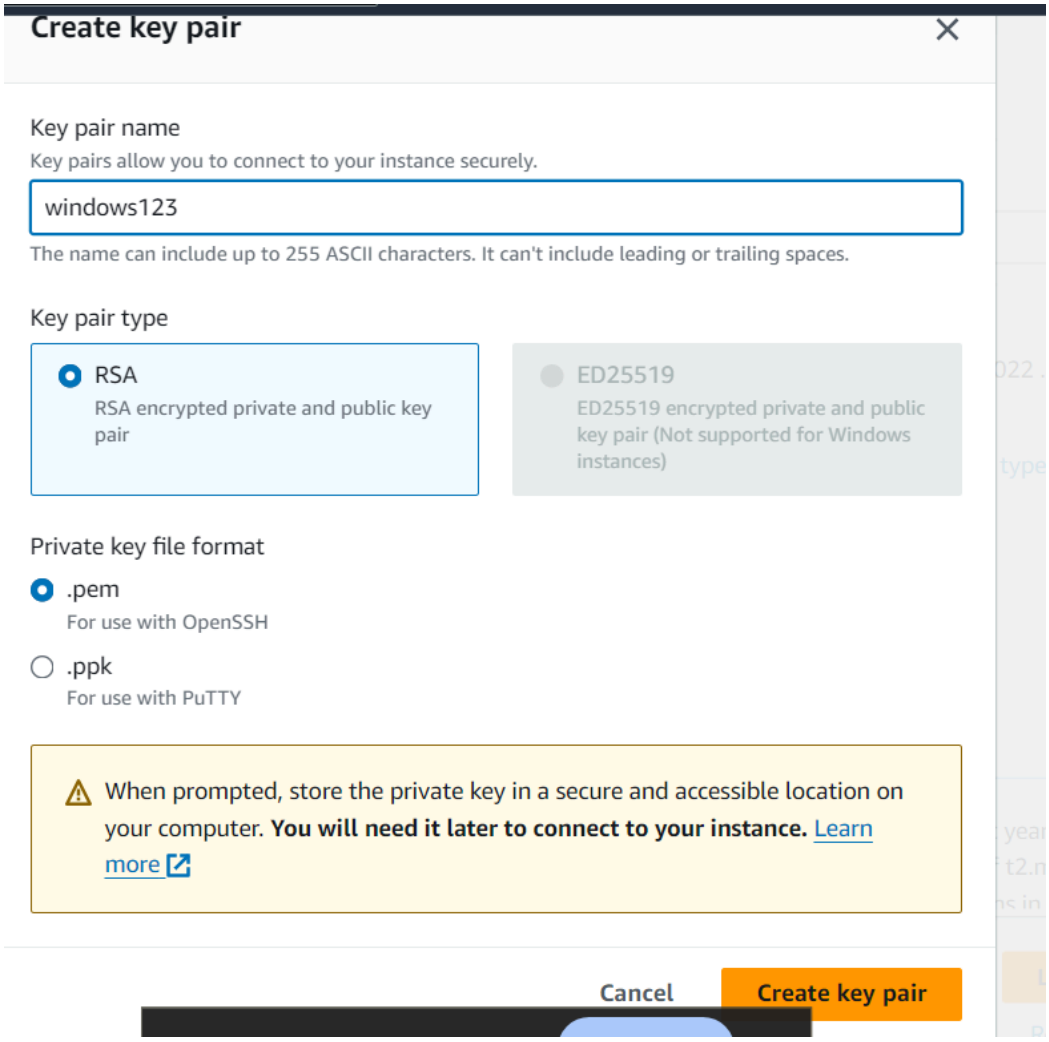
   STEPS:

   Step 1: Sign into your AWS account
   Step 2: Select All Services, Select EC2

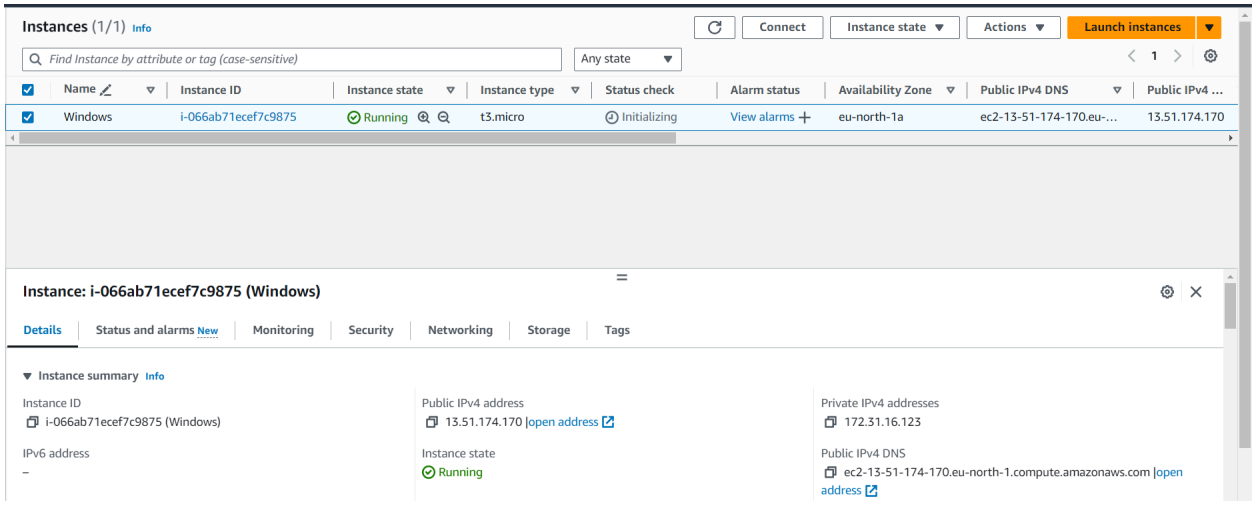


   Step 3: Launch Instance, create key value pair, pem and save
   Step 4: Select Windows and launch the instance

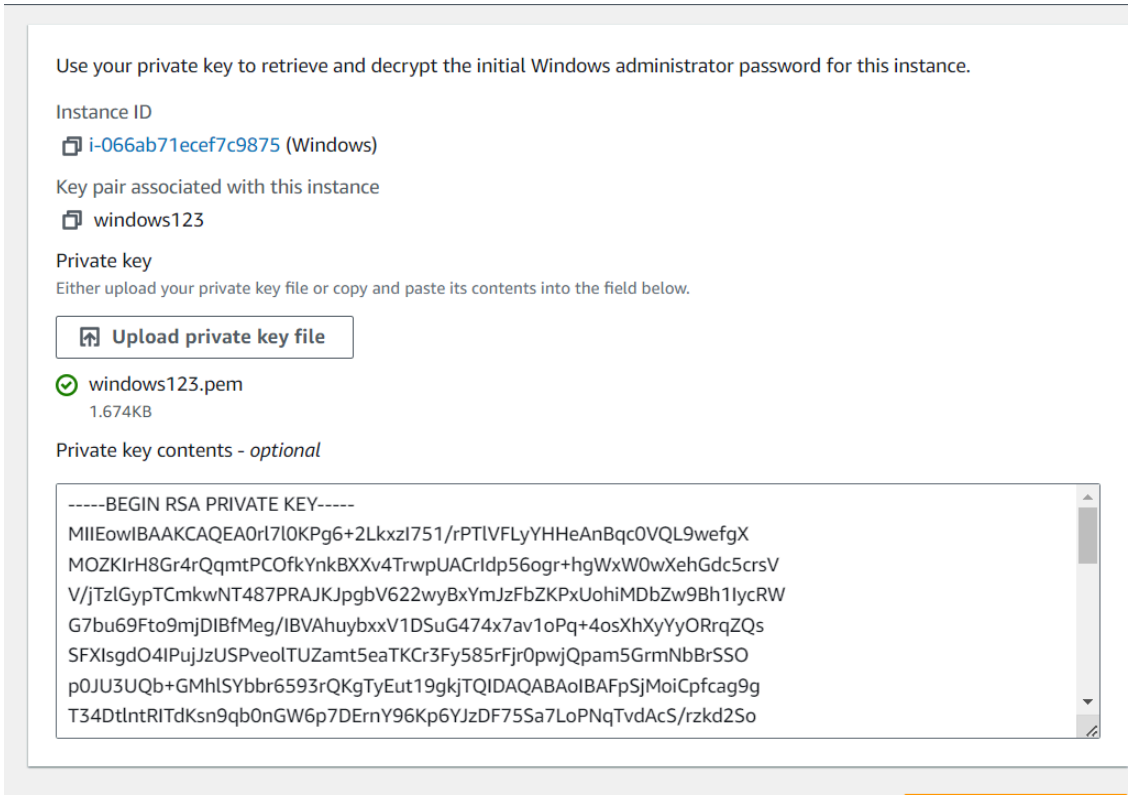




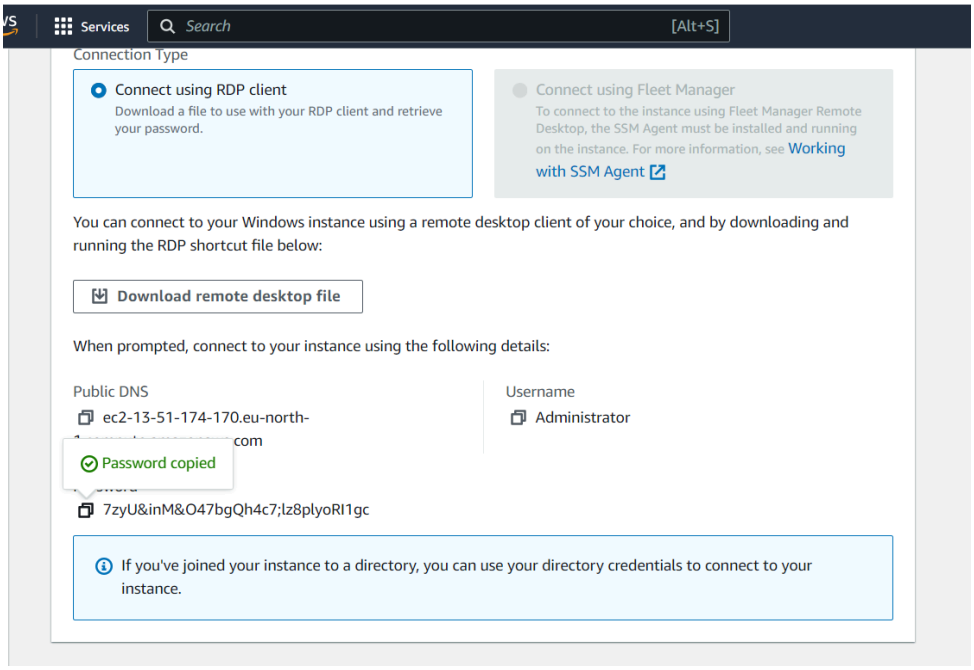
Step 5: Go to instances and initialize and then start running



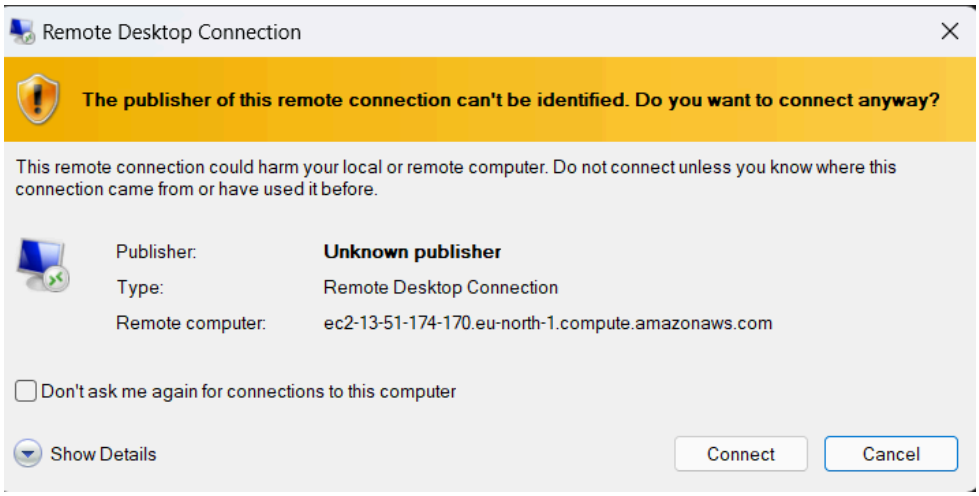
Step 6: Select the instance, click on connect for connecting the RDP client

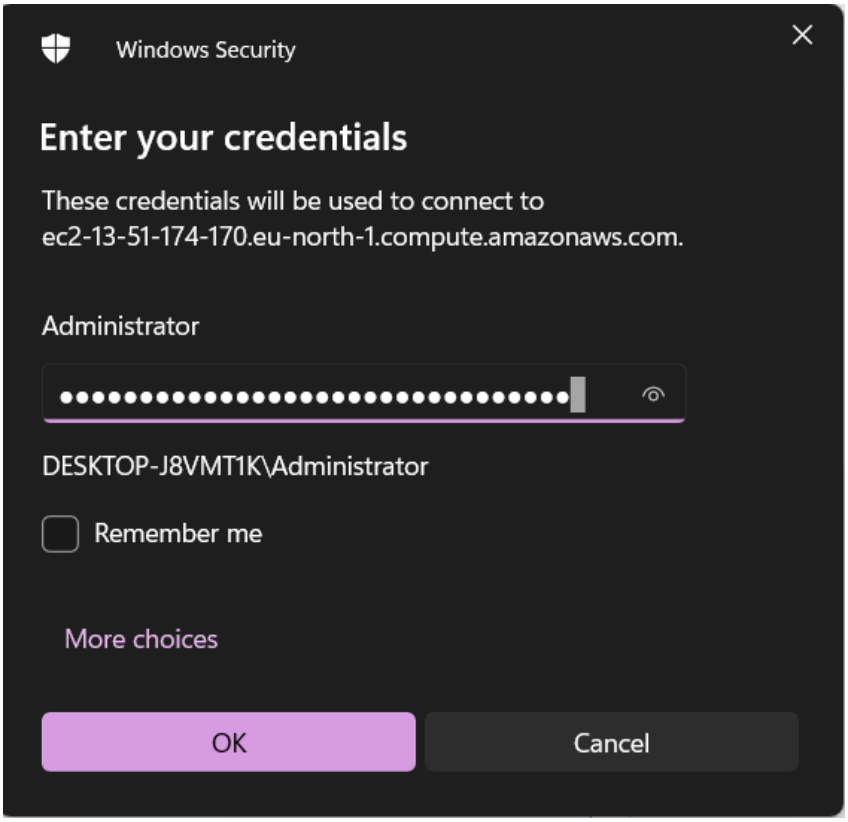


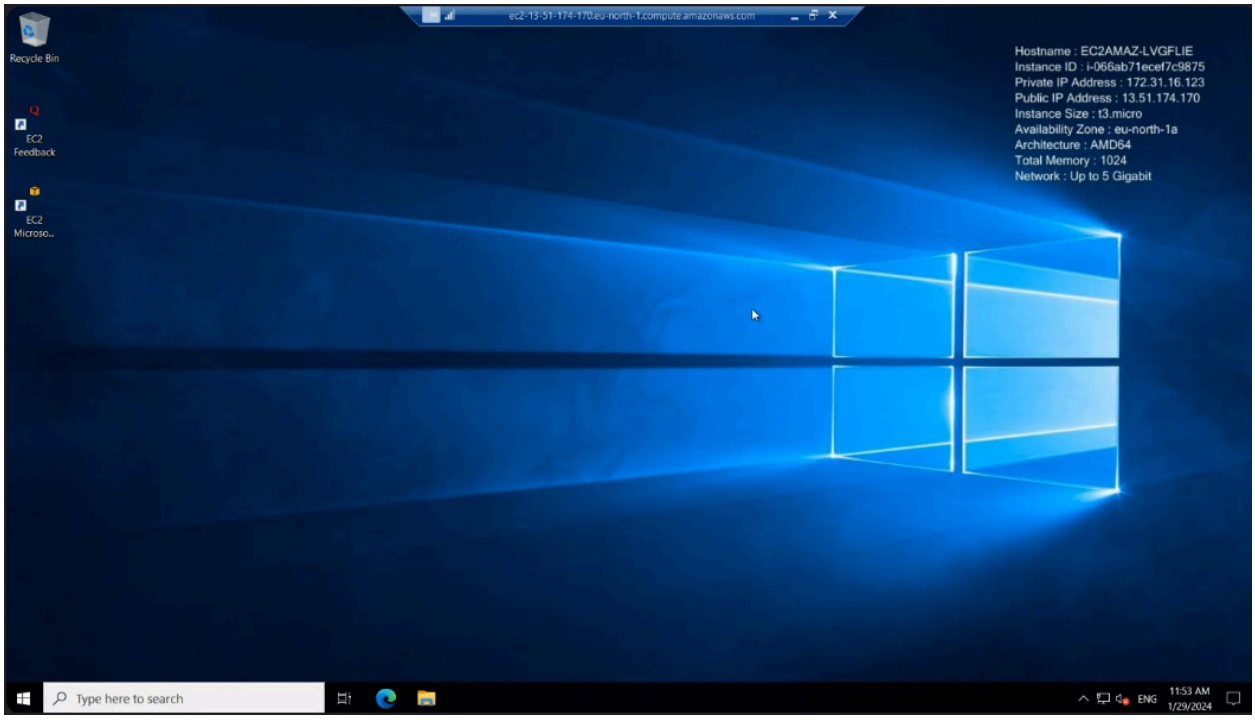
Step 7: Decrypt the password. Copy the password.



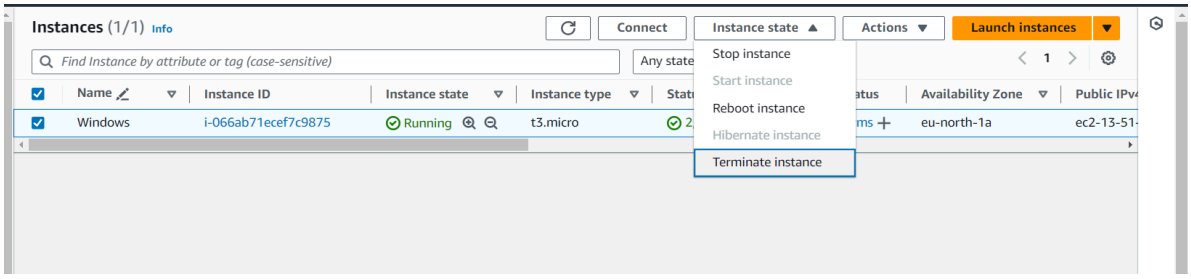
Step 8: Open remote desktop connection







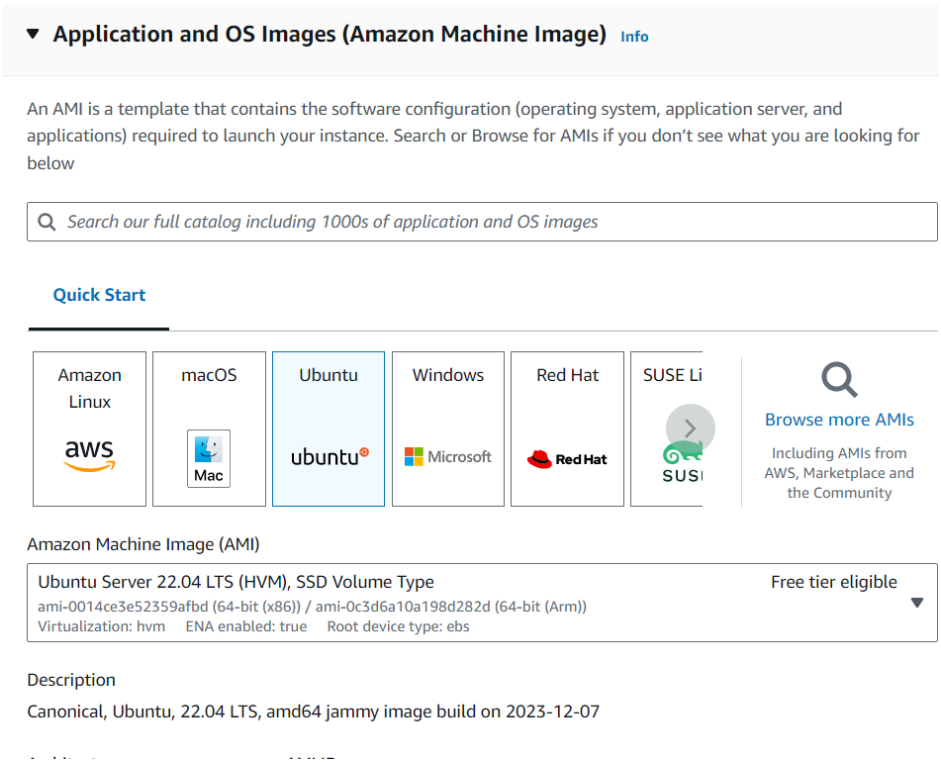
Step 9: Close RDP and go back to instances
Step 10: Terminate the instance



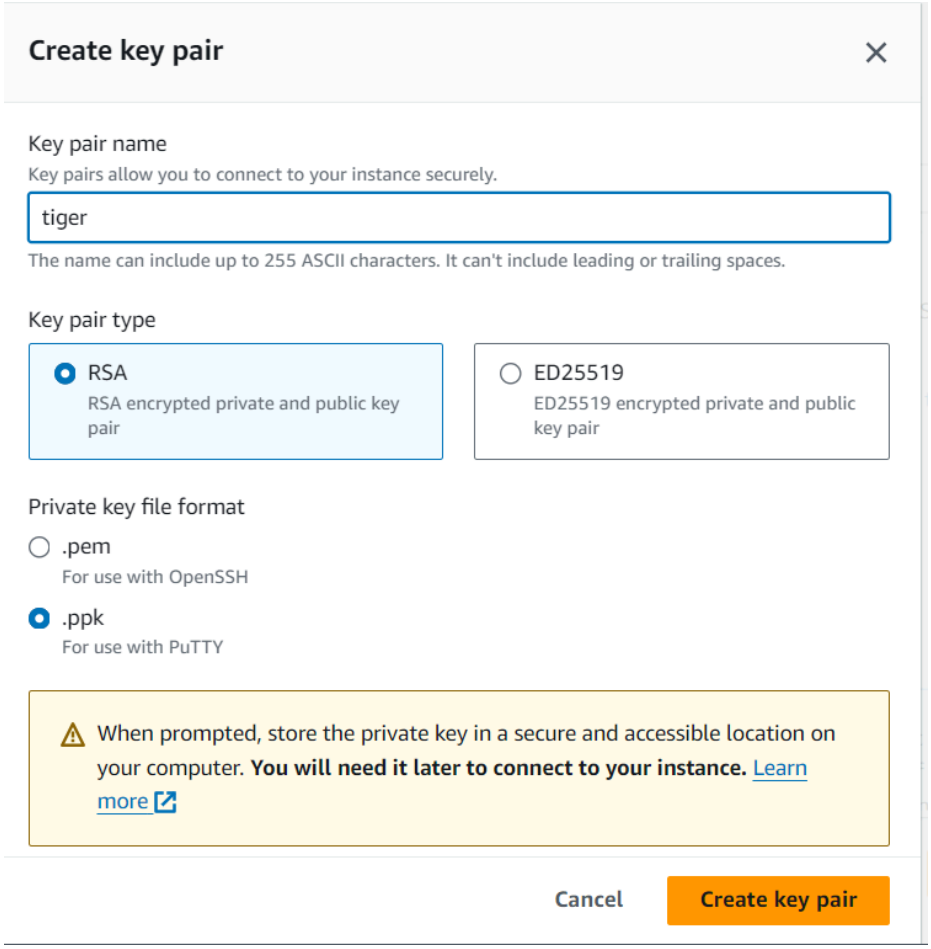
2. **Implement Ubuntu machine using AWS ec2 and execute the Linux commands.**
    - Disk information in human readable format
    - Create a folder with your name
    - Create a file with your cityname and add your address in it
    - Display the created file
    - Copy the contents of the created file in other file and print it
    - Install firefox/python 3

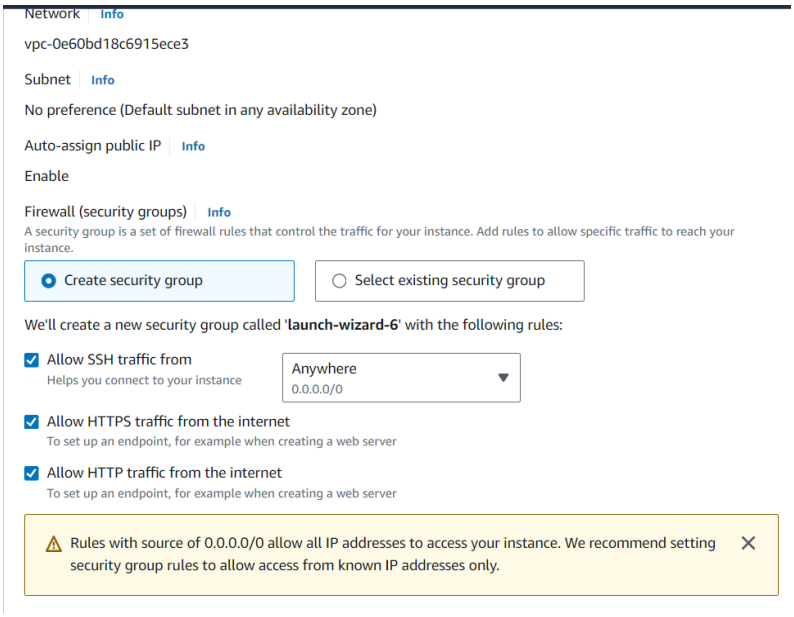
STEPS:

Step 1: Launch a new instance for Linux
Step 2: Write a new web server name and select Ubuntu server

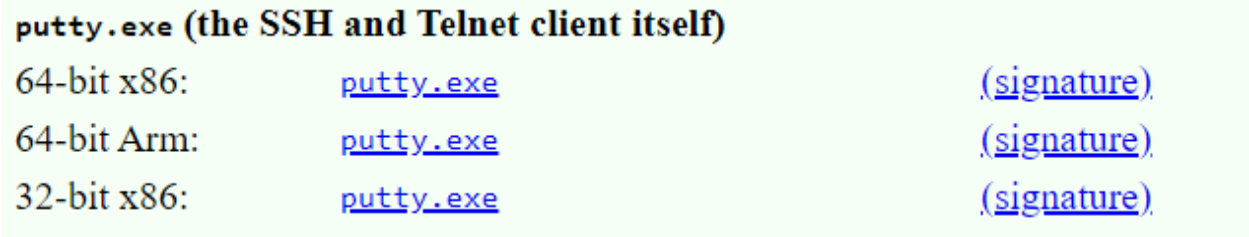


Step 3: Create a new key value pair and select ppk



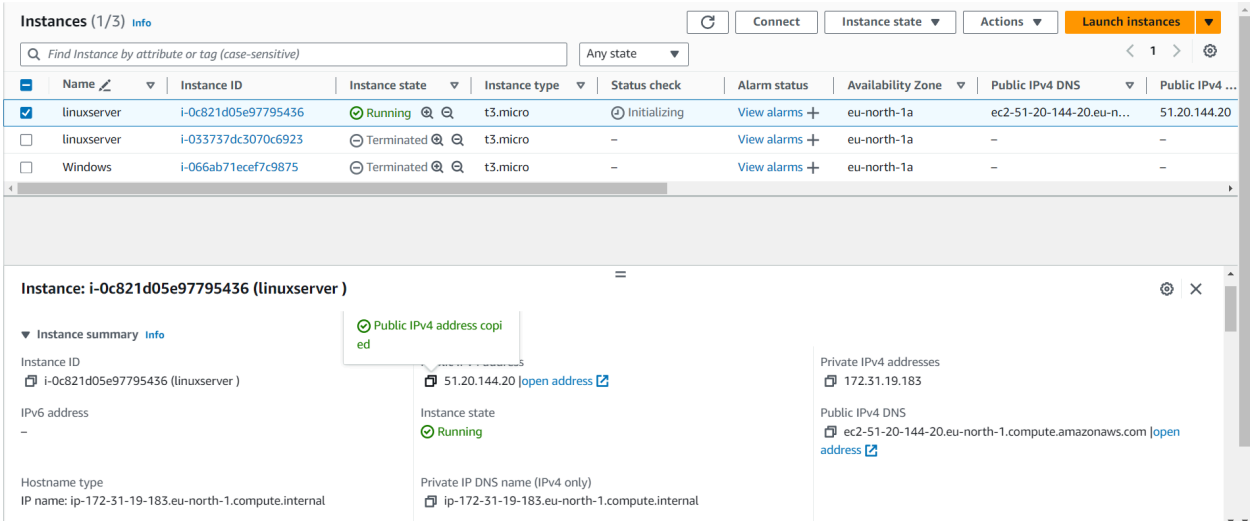


Step 4: Download putty.exe file from Google

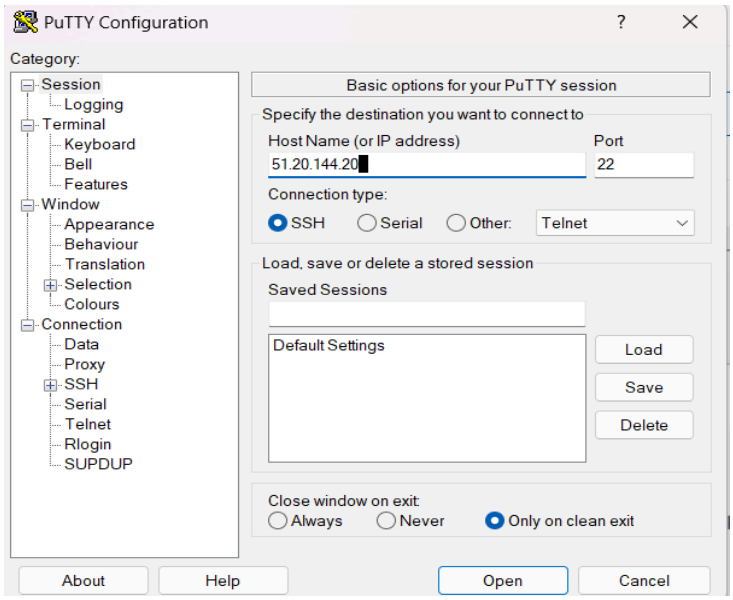


Step 5: Launch the instance

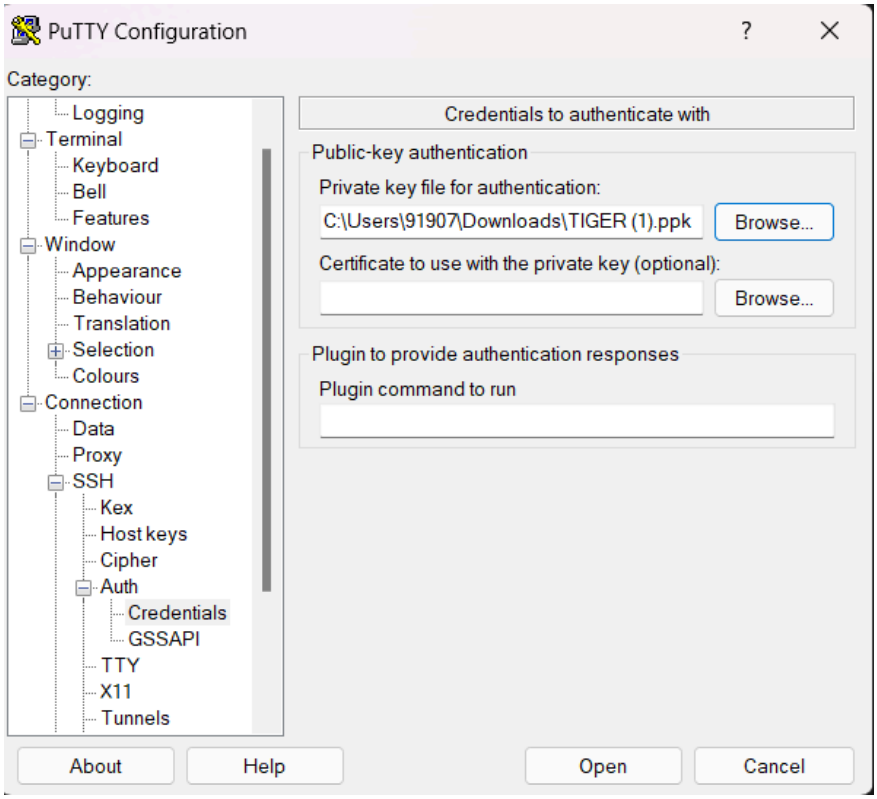
Step 6: Select and copy public IPV4 address



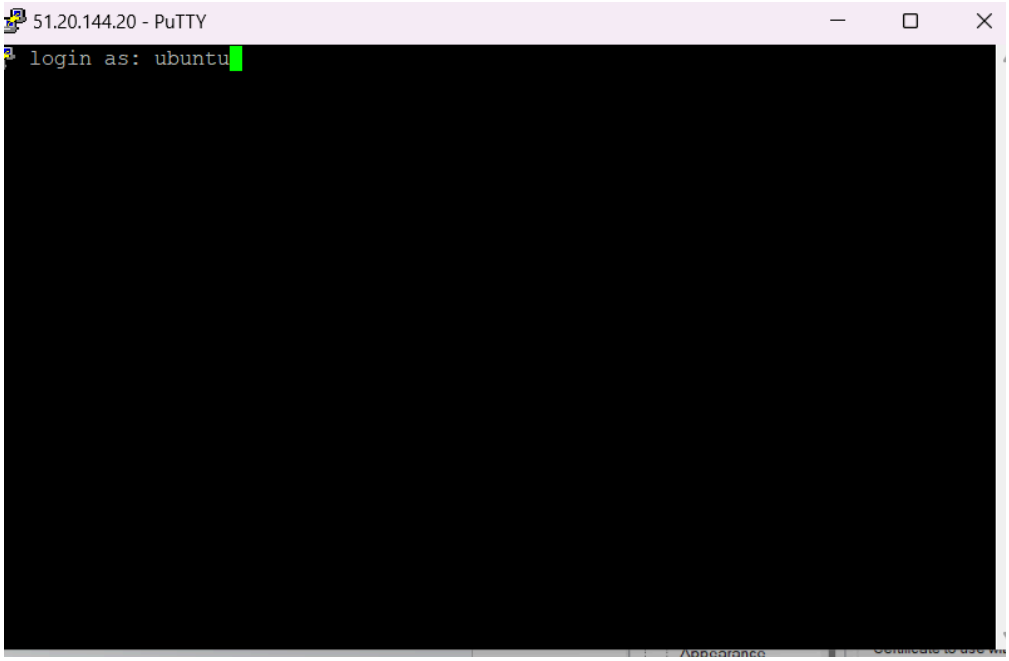
Step 5: Go to putty and paste the IP address



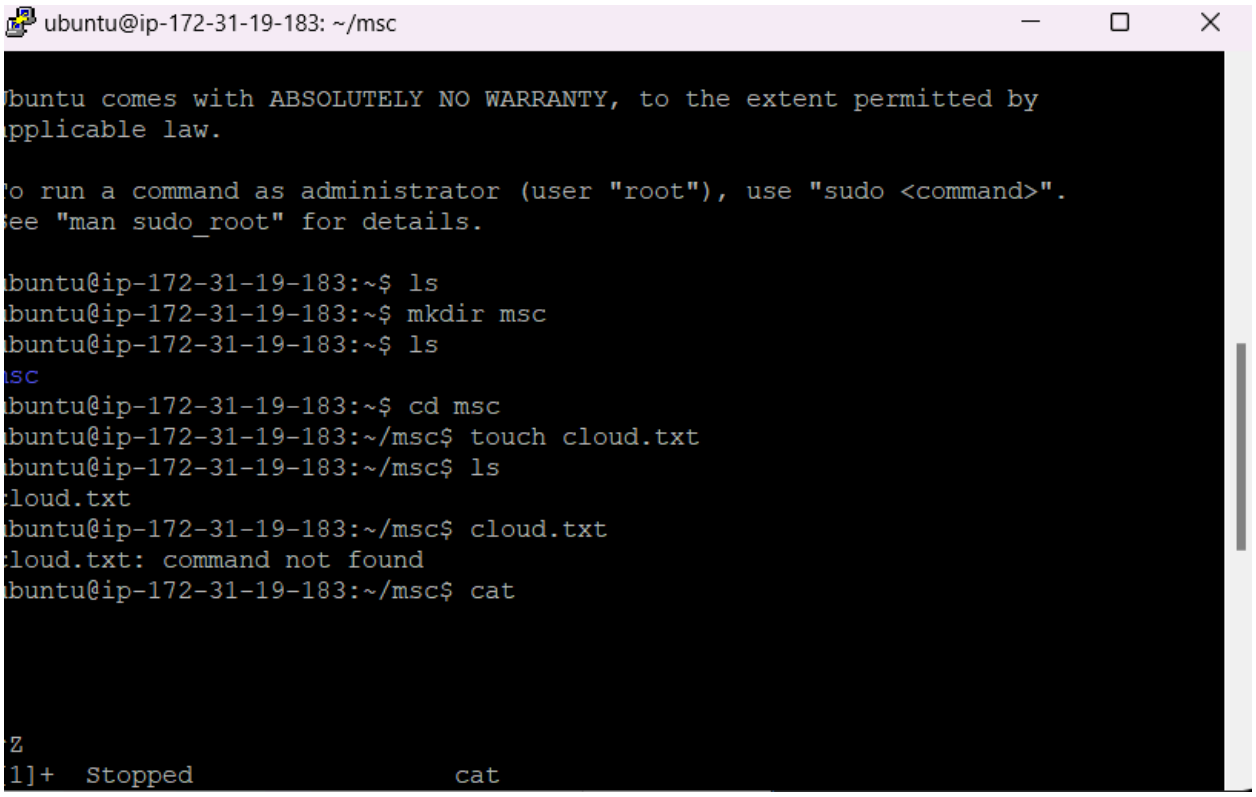
Step 6: Go to category → SSH → auth → credentials → select the ppk file

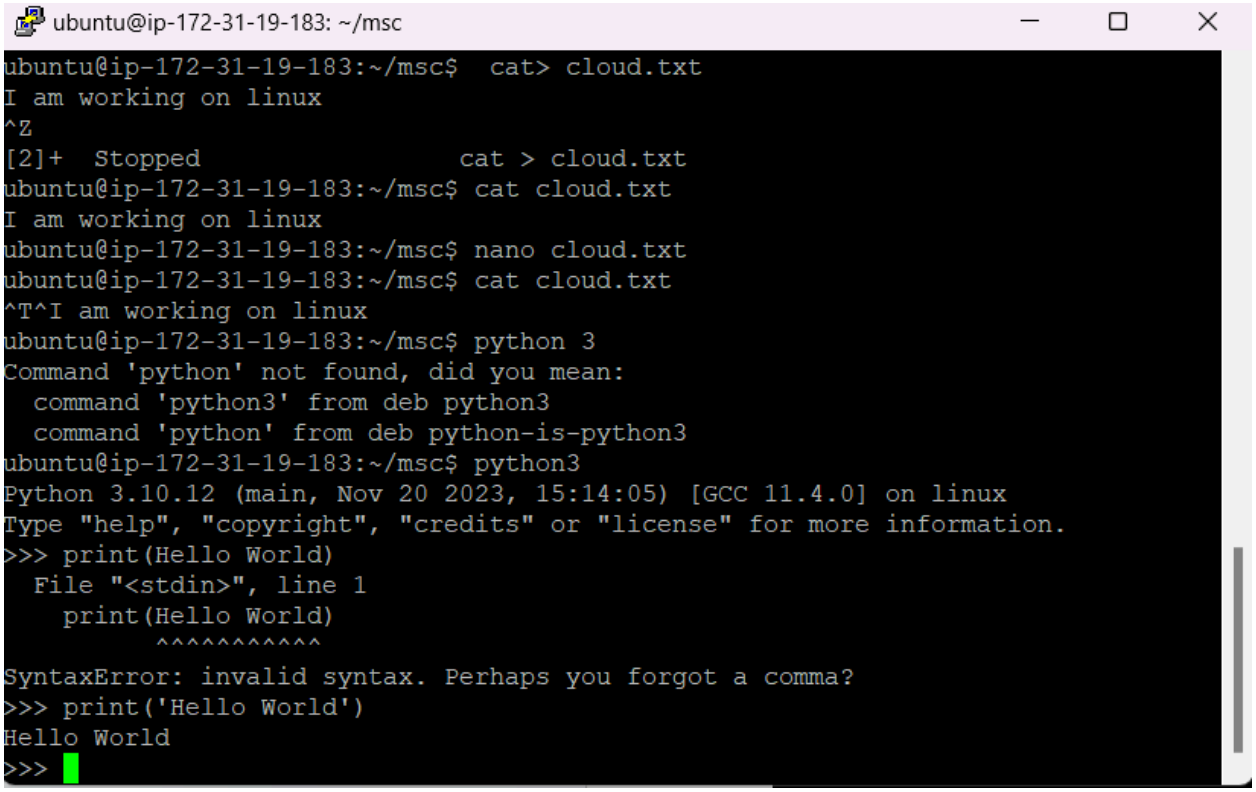


Step 7: Putty will launch
Step 8: Login as ubuntu

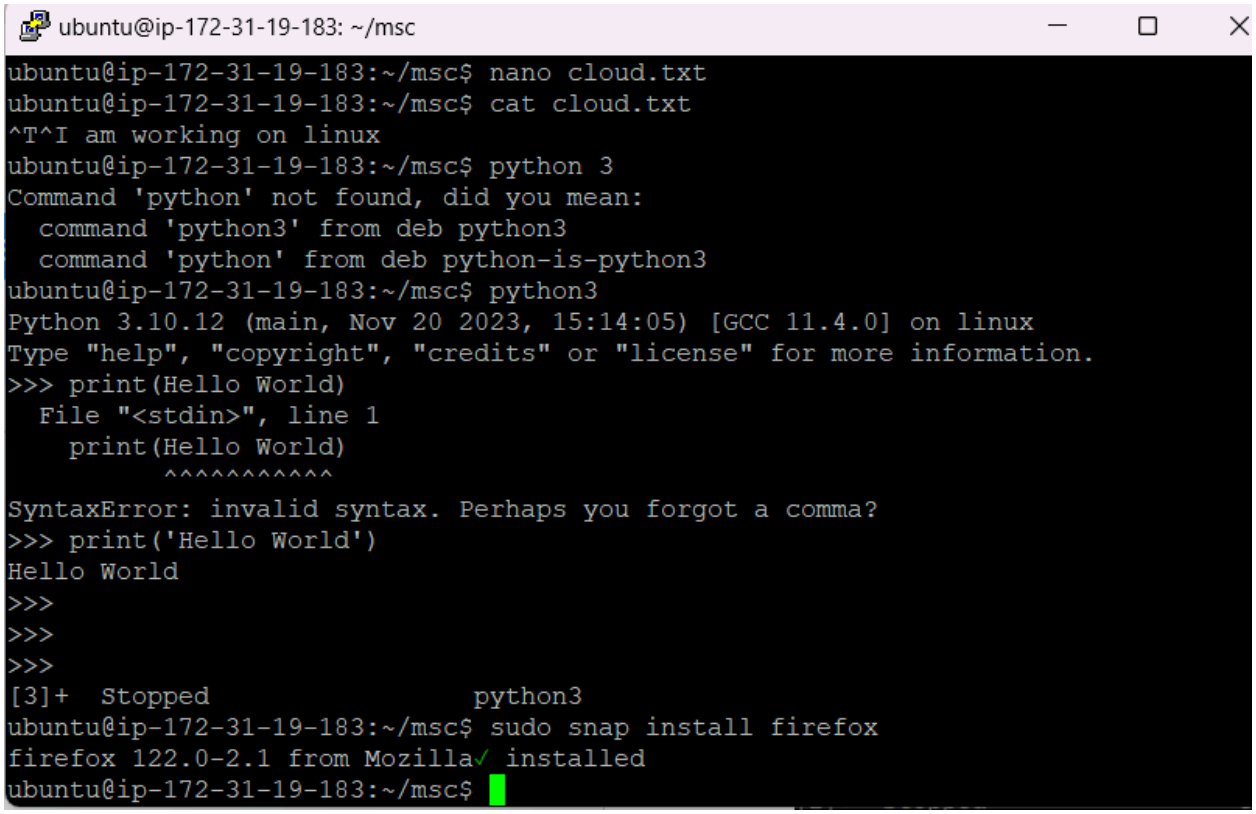


Step 9: Install python





Step 10: Install Firefox


ubuntu@ip-172-31-19-183: ~/msc
ubuntu@ip-172-31-19-183:~/msc$ nano cloud.txt
ubuntu@ip-172-31-19-183:~/msc$ cat cloud.txt
^T^I am working on linux
ubuntu@ip-172-31-19-183:~/msc$ python 3
Command 'python' not found, did you mean:
command 'python3' from deb python3
command 'python' from deb python-is-python3
ubuntu@ip-172-31-19-183:~/msc$ 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 World)
File "<stdin>", line 1
print(Hello World)
^^^^^^^^^^^
SyntaxError: invalid syntax. Perhaps you forgot a comma?
>>> print('Hello World')
Hello World
>>>
>>>
>>>
[3]+ Stopped python3
ubuntu@ip-172-31-19-183:~/msc$ sudo snap install firefox
firefox 122.0-2.1 from Mozilla✓ installed
ubuntu@ip-172-31-19-183:~/msc$