

# INTRODUCTION TO VIRTUALIZATION AND

## CLOUD COMPUTING

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BATCH- 5

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### Experiment 9: Creating a Linux EC2 instance and

#### connecting to it through Putty

**PuTTY** is an open-source, lightweight, and completely free SSH client. Its primary function is to connect to a computer remotely while providing the ability to transfer files, manipulate data, and so on. It supports a number of network protocols, including SSH, Telnet, Serial, SCP, SFTP, and others.

#### **What is EC2 service in AWS?**

Amazon Elastic Compute Cloud (Amazon EC2) is a computing capacity that is scalable in the Amazon Web Services (AWS) Cloud. Using Amazon EC2 eliminates the need to invest in hardware upfront, allowing you to develop and deploy applications more quickly.

#### **What are the different kinds of instances available in EC2 service?**

**On-Demand Instances:** This is the simplest and least complicated method of provisioning Amazon EC2 Instances. It's a pay-as-you-go system. Purchasing On-Demand EC2 Instances is also the most

expensive way to provision resources. On-Demand Instances are recommended by AWS for applications with short-term, irregular workloads that cannot be interrupted. They are also appropriate for use during application testing and development on EC2.

**Reserved Instances:** Reserved Instance (RI) purchases are one of the simplest ways to begin cutting cloud costs. When you purchase a RI, you are "reserving" that instance for one to three years. In exchange for that long-term commitment, AWS offers a substantial discount of up to 72% off On-Demand prices.

**Spot Instances:** Spot Instances give you access to Amazon's "extra" capacity. They are available at steep discounts of up to 90% off On-Demand EC2 prices. Spot Instances are appropriate for applications and workloads that require a fast network, quick storage, massive amounts of memory, and high computing power.

**Savings Plans:** Savings Plans are a flexible pricing model that offers lower prices than On-Demand pricing in exchange for a specific usage commitment (measured in dollars per hour) for one or three years. Compute Savings Plans, EC2 Instance Savings Plans, and Amazon SageMaker Savings Plans are the three types of Savings Plans offered by AWS. the savings plan formula is the following: final saving = number of period \* (first period saving + last period saving) / 2

## **What do you understand by AWS marketplace?**

AWS Marketplace is a curated digital catalogue where customers can find, buy, deploy, and manage third-party software, data, and services to help them build solutions and run their businesses. Qualified partners can market and sell their software to AWS customers through the AWS Marketplace. It is an online software store that allows customers to find, buy, and immediately begin using AWS software and services.

## **What do you understand by AMIs?**

AMI is an abbreviation for Amazon Machine Images. In the Amazon Web Services (AWS) environment, an AMI is a virtual image that is used to create a virtual machine within an EC2 instance. Machine images are similar to templates in that they are pre-configured with an operating system and other software that determines the user's operating environment. You launch an instance from an AMI, which is a copy of the AMI running as a virtual server in the cloud.

## **What do you understand by Security Group Rules?**

A security group's rules govern the inbound traffic allowed to reach the instances associated with the security group. The rules also govern the amount of outbound traffic that is permitted to leave them. You can use security group rules to filter traffic based on protocols and port numbers. Each security group can have up to 50 inbound IPv4 rules, 50 inbound IPv6 rules, 50 outbound IPv4 rules and 50 outbound IPv6 rules.

## **Which kind of security feature is used to connect to EC2 instance?**

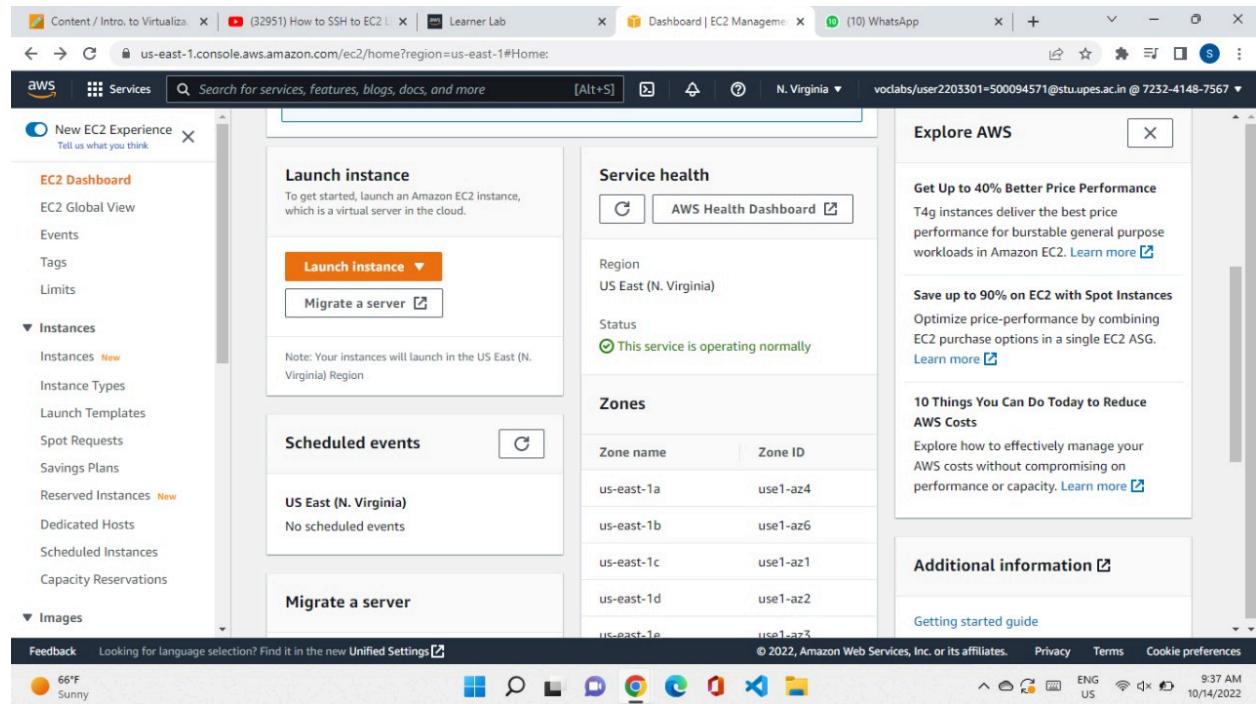
AWS prioritizes cloud security above all else. The shared responsibility model defines this as cloud security and cloud security:

- Cloud security - AWS is in charge of protecting the infrastructure that runs AWS services in the AWS Cloud. AWS also offers services that can be used securely. Third-party auditors test and verify the effectiveness of our security on a regular basis.
- Cloud security - Your responsibilities include the following:
  - 1) Controlling network access to your instances by configuring your VPC and security groups, for example.
  - 2) Managing the login information used to connect to your instances.
  - 3) Managing the guest operating system and software installed on it, including updates and security patches.
  - 4) Configuring the IAM roles attached to the instance, as well as the permissions associated with those roles.

**Step1:** Open the Amazon EC2 console at

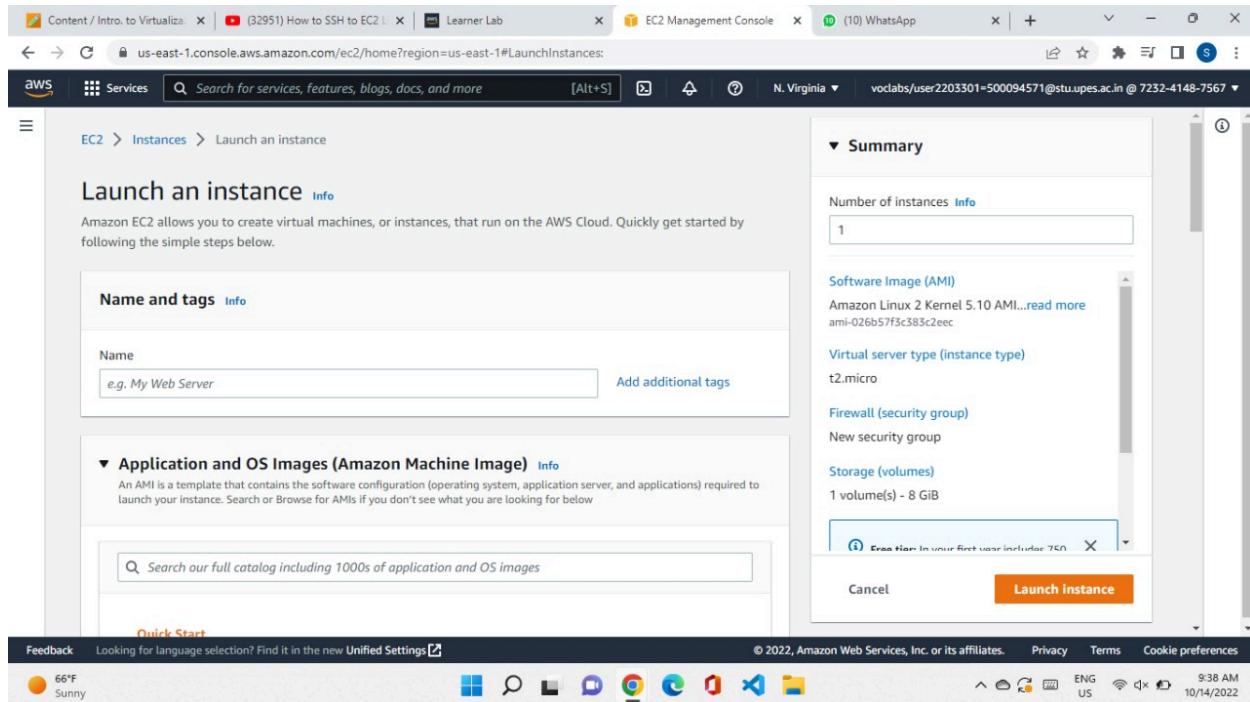
<https://console.aws.amazon.com/ec2/>

**Step 2:** From the console dashboard, choose Launch Instance.



**Step3:** On the Launch an instance page, write Name and tags for

instance.



**Step4:** Choose an Amazon Machine Image (AMI). Select the AMI for “Amazon Linux 2 AMI- KERNEL 5.10”. Notice that these AMIs are marked "Free tier eligible". And click on Launch instance.

The screenshot shows the AWS EC2 Management Console interface. The top navigation bar includes tabs for Content / Intro. to Virtualiz., (32951) How to SSH to EC2 L, Learner Lab, EC2 Management Console, and (10) WhatsApp. The URL is us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances. The user is signed in as N. Virginia and has the email vodlabs/user2203301+500094571@stu.upes.ac.in at 7232-4148-7567.

The main content area displays a search bar with the placeholder "Search for an AMI by entering a search term e.g. "Windows"" and a dropdown menu with categories: Quickstart AMIs (46), My AMIs (0), AWS Marketplace AMIs (6221), and Community AMIs (500).

A sidebar titled "Refine results" contains filters for Free tier only (checked), OS category (All Linux/Unix, All Windows), and Architecture (64-bit (Arm), 32-bit (x86), 64-bit (x86), 64-bit (Mac), 64-bit (Mac-Arm)).

The results list shows two AMIs:

- Amazon Linux 2 AMI (HVM) - Kernel 5.10, SSD Volume Type**  
ami-026b57f3c383c2eec (64-bit (x86)) / ami-0636eac5d73e0e5d7 (64-bit (Arm))  
Amazon Linux 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.  
Platform: amazon Root device type: ebs Virtualization: hvm ENA enabled: Yes
- Amazon Linux 2 AMI (HVM) - Kernel 4.14, SSD Volume Type**  
ami-0464d49b8794eba32 (64-bit (x86)) / ami-04a6f35599c6eb1807 (64-bit (Arm))  
Amazon Linux 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.  
Platform: amazon Root device type: ebs Virtualization: hvm ENA enabled: Yes

The bottom of the page includes a feedback link, language selection, and standard footer links for Privacy, Terms, and Cookie preferences. The date and time are 9:40 AM on 10/14/2022.

This screenshot shows the AWS EC2 Management Console during the instance launch process. The top navigation bar and user information are identical to the previous screenshot.

The main content area displays the "AMI from catalog" section. A search bar says "Search our full catalog including 1000s of application and OS images". Below it, a table lists an AMI entry:

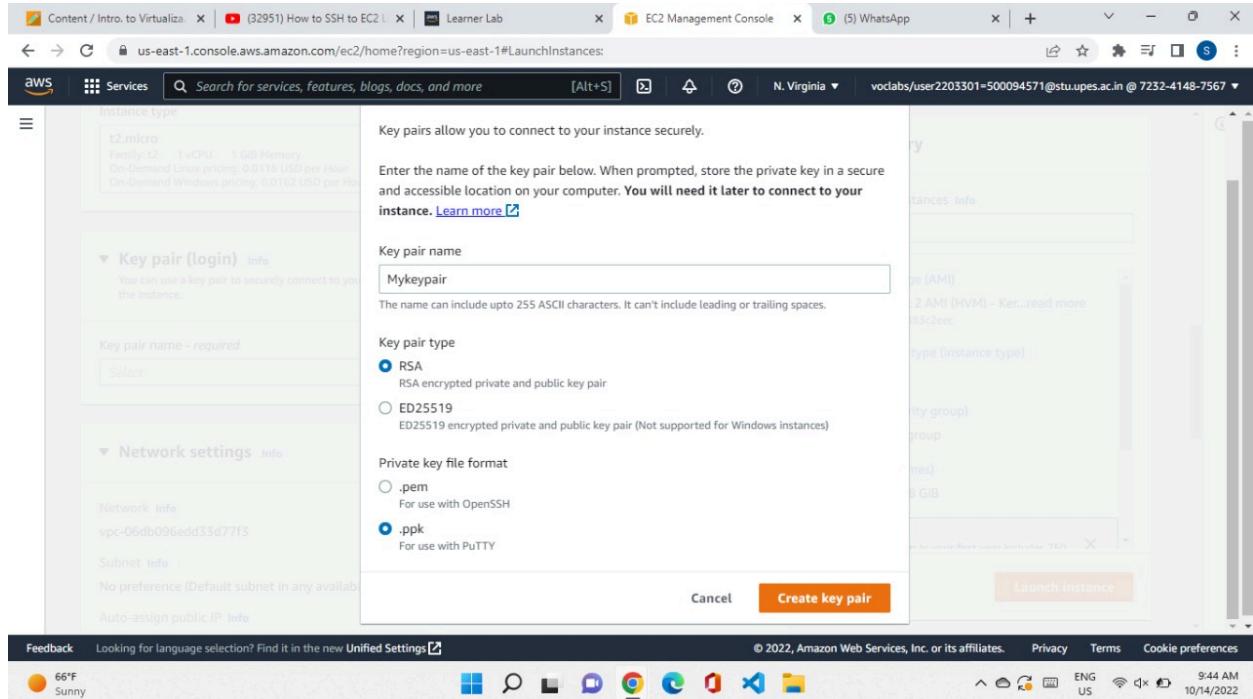
Amazon Machine Image (AMI)		Quick Start			
Catalog	Published	Architecture	Virtualization	Root device type	ENA Enabled
Quickstart AMIs	2022-09-15T08:59:11.00Z	x86_64	hvm	ebs	Yes

To the right of the table, there's a "Free tier eligible" badge and a "Verified provider" badge. A "Browse more AMIs" link is also present.

The right side of the screen shows the "Summary" tab of the launch wizard, which includes fields for the number of instances (set to 1), software image (Amazon Linux 2 AMI (HVM)), virtual server type (t2.micro), firewall (New security group), and storage (1 volume(s) - 8 GiB). A note indicates "Encryption in transit uses SSL/TLS".

At the bottom, there are "Cancel" and "Launch Instance" buttons. The bottom of the page includes a feedback link, language selection, and standard footer links for Privacy, Terms, and Cookie preferences. The date and time are 9:40 AM on 10/14/2022.

**Step5:** For a key pair, select “Create new key pair”, then give key pair name.



**Step6:** Click on Edit button then choose security group as “ALL TCP, ALL UDP”. Then click on Launch Instances.

The screenshot shows the AWS EC2 Management Console interface. In the top navigation bar, there are several tabs: Content / Intro. to Virtualiz., (32951) How to SSH to EC2 L, Learner Lab, EC2 Management Console, and (5) WhatsApp. The main content area is titled "Launch Instances".

**Security Group Rule:**

- Type: All TCP
- Protocol: TCP
- Port range: 0-65535
- Source type: Anywhere
- Description: e.g. SSH for admin desktop

A warning message states: "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."

**Summary Panel:**

- Number of instances: 1
- Software Image (AMI): Amazon Linux 2 AMI (HVM) - Ker... (read more)
- Virtual server type (instance type): t2.micro
- Firewall (security group): New security group
- Storage (volumes): 1 volume(s) - 8 GiB

**Bottom Buttons:**

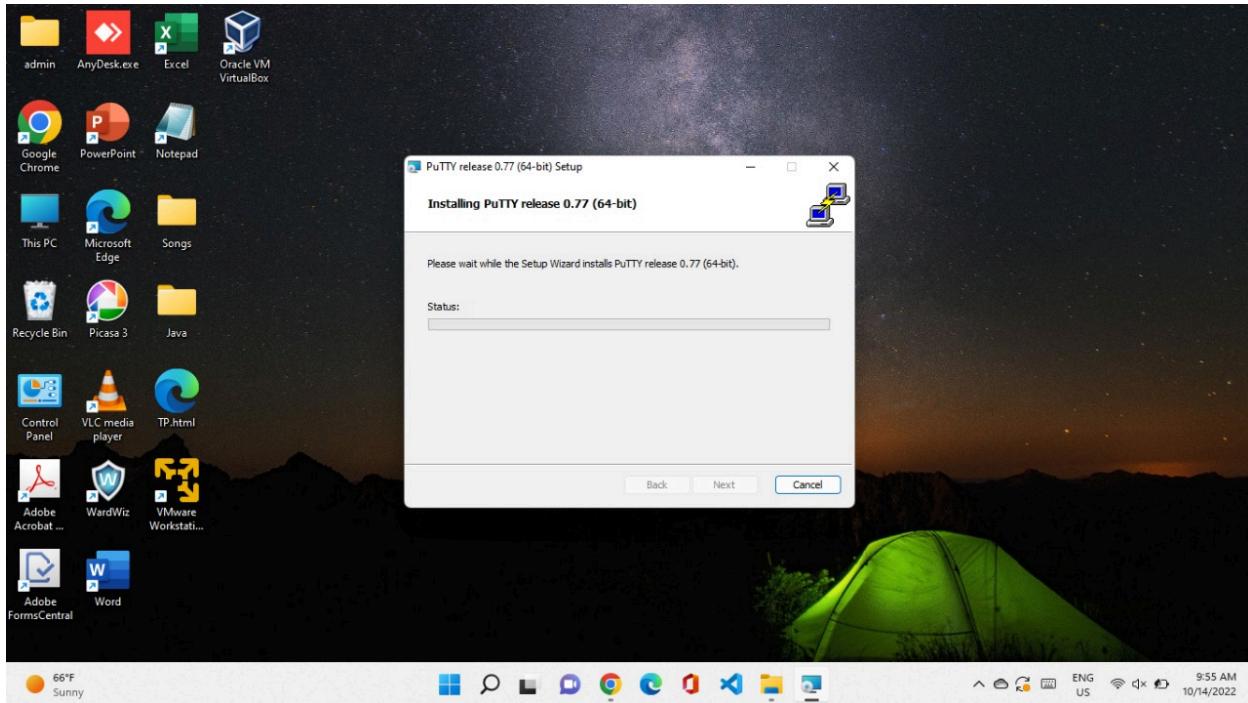
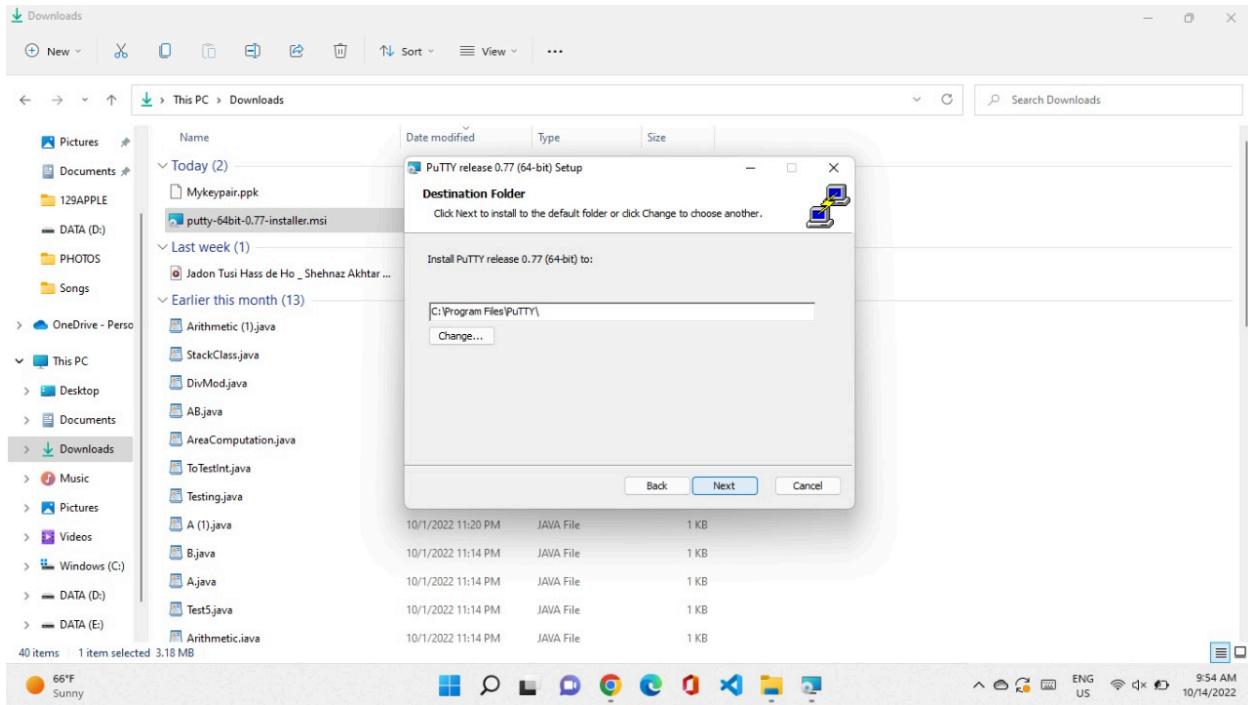
- Cancel
- Launch Instance

The browser status bar at the bottom shows: Feedback Looking for language selection? Find it in the new Unified Settings. © 2022, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences. 66°F Sunny 9:52 AM 10/14/2022.

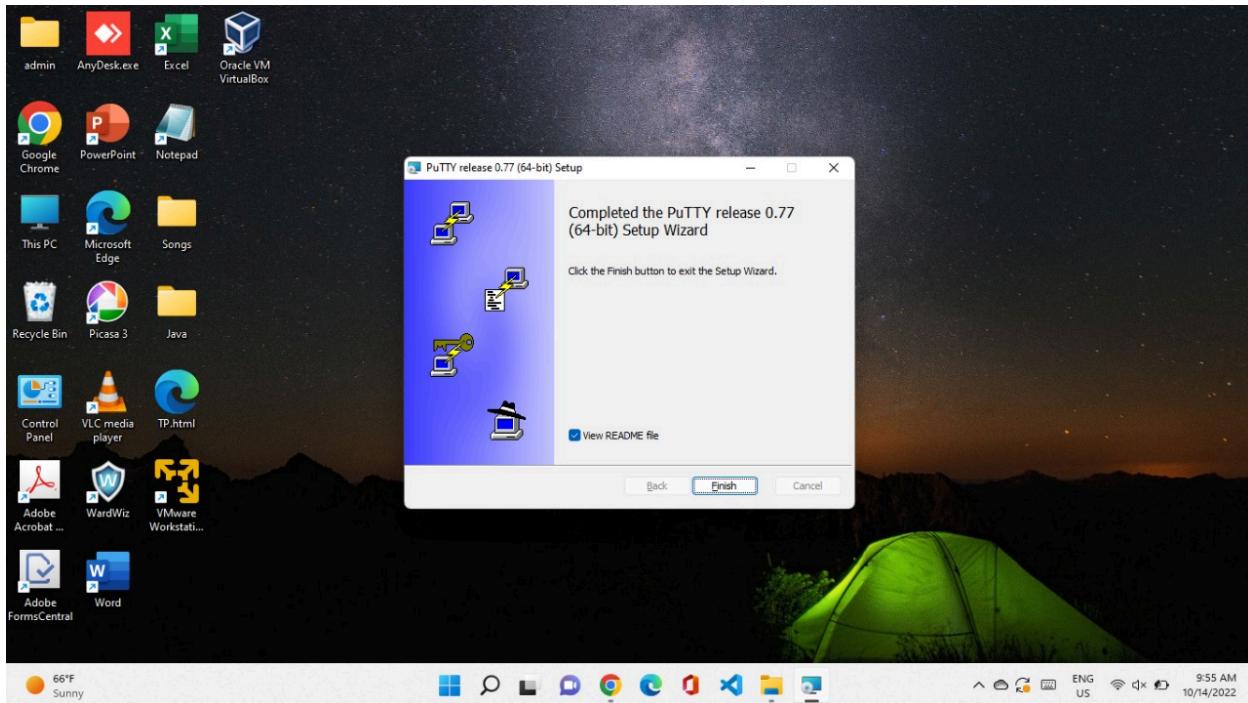
**STEP7:** Now instance is launching and showing instance state is pending.

**Step 8:** You will see that your instance is running. Click on “connect”.

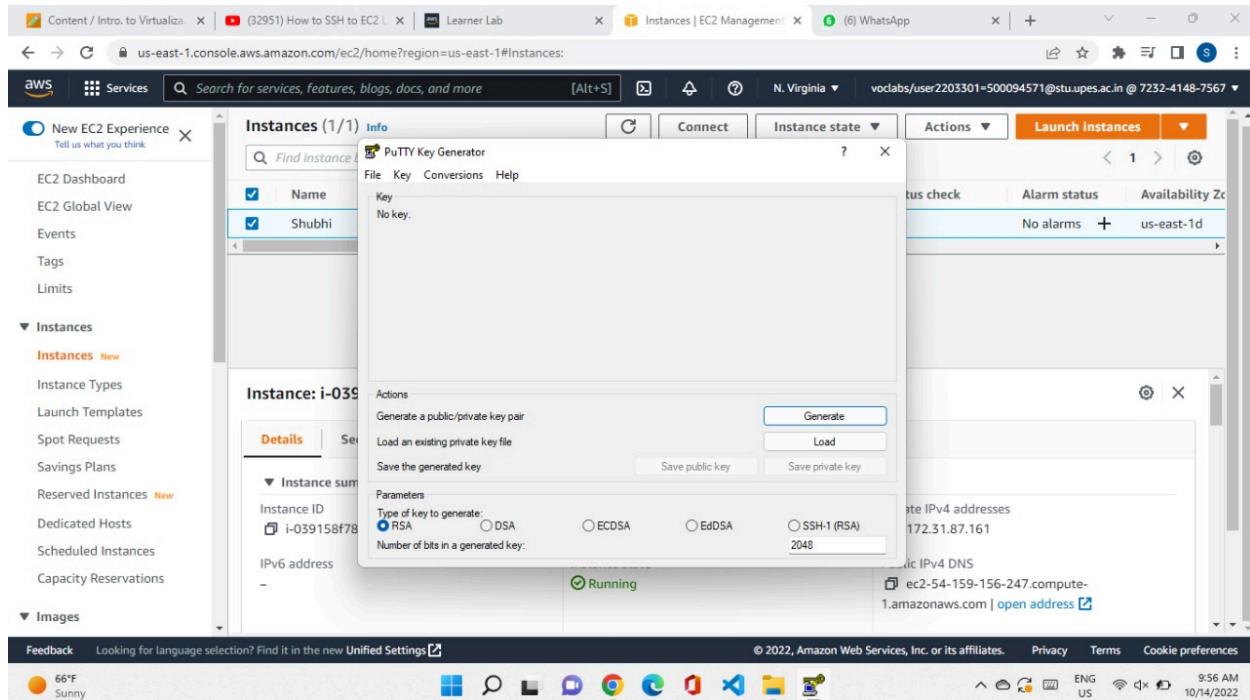
**Step 9:** Now Download PUTTY



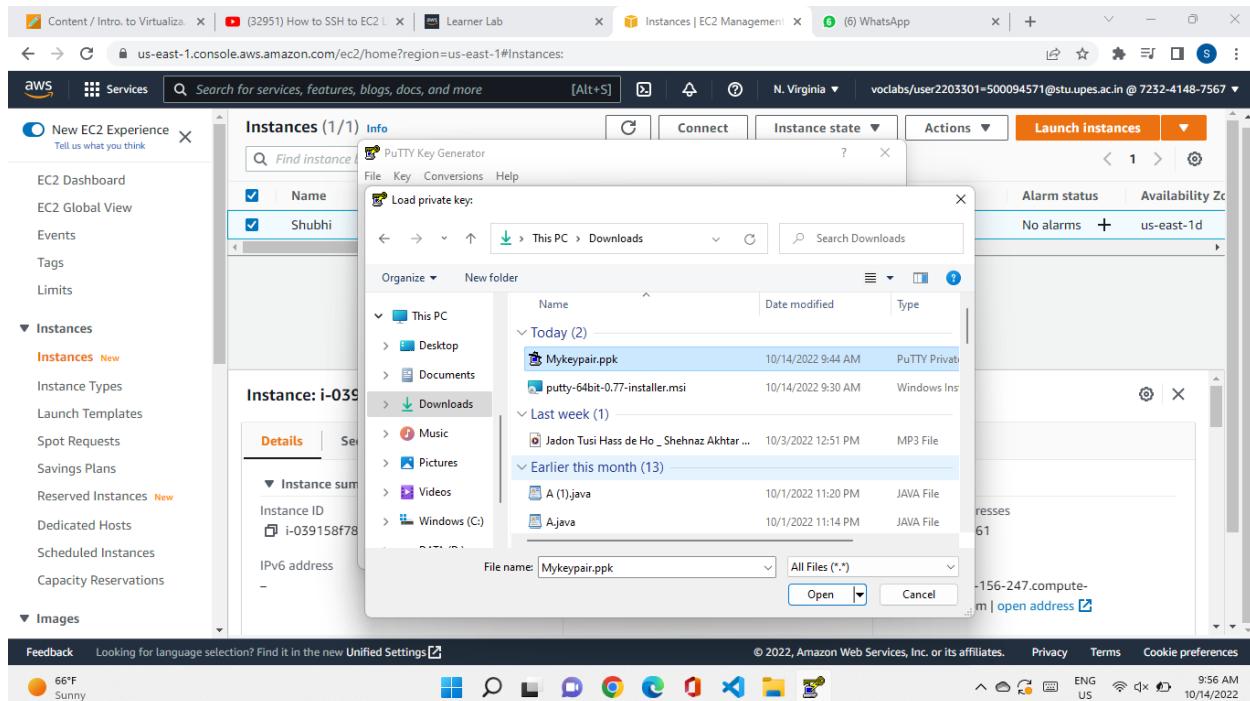
## Click Finish Button

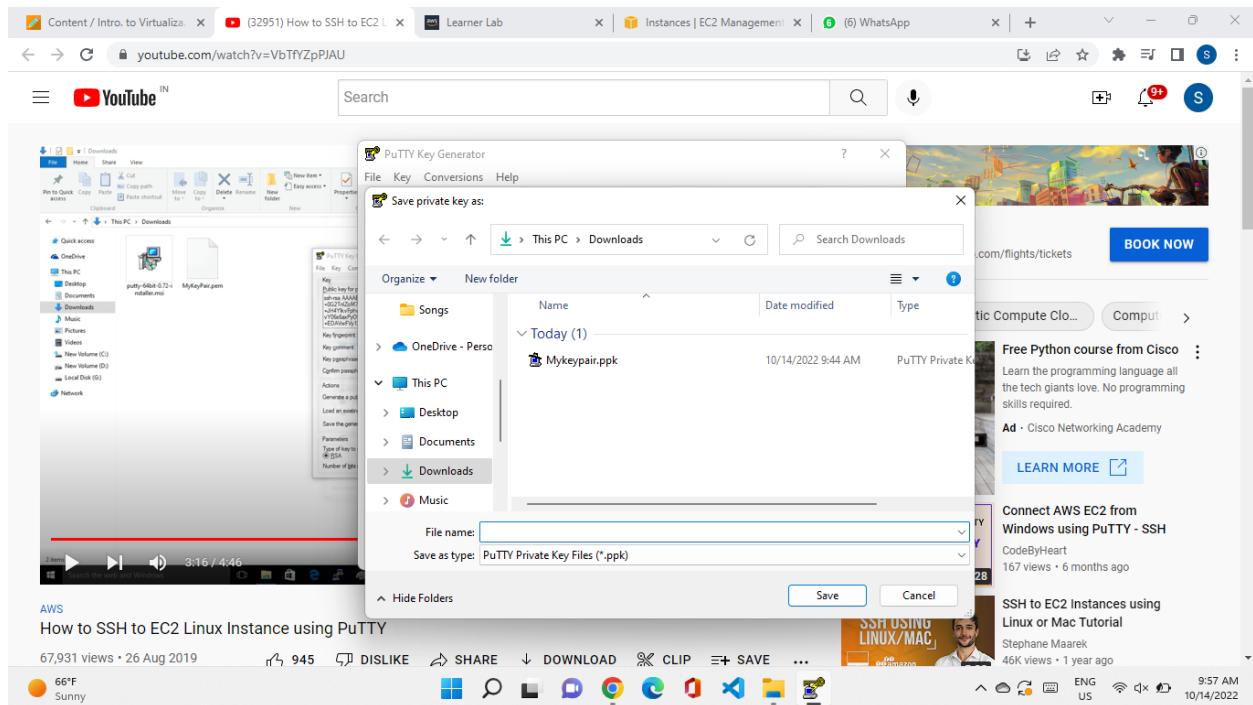


**Step 10:** Open PUTTY Key Generator. In PuTTY Key Generator, click the **Load** button and navigate to the folder that contains the private key file (.pem) created during the EC2 configuration process.

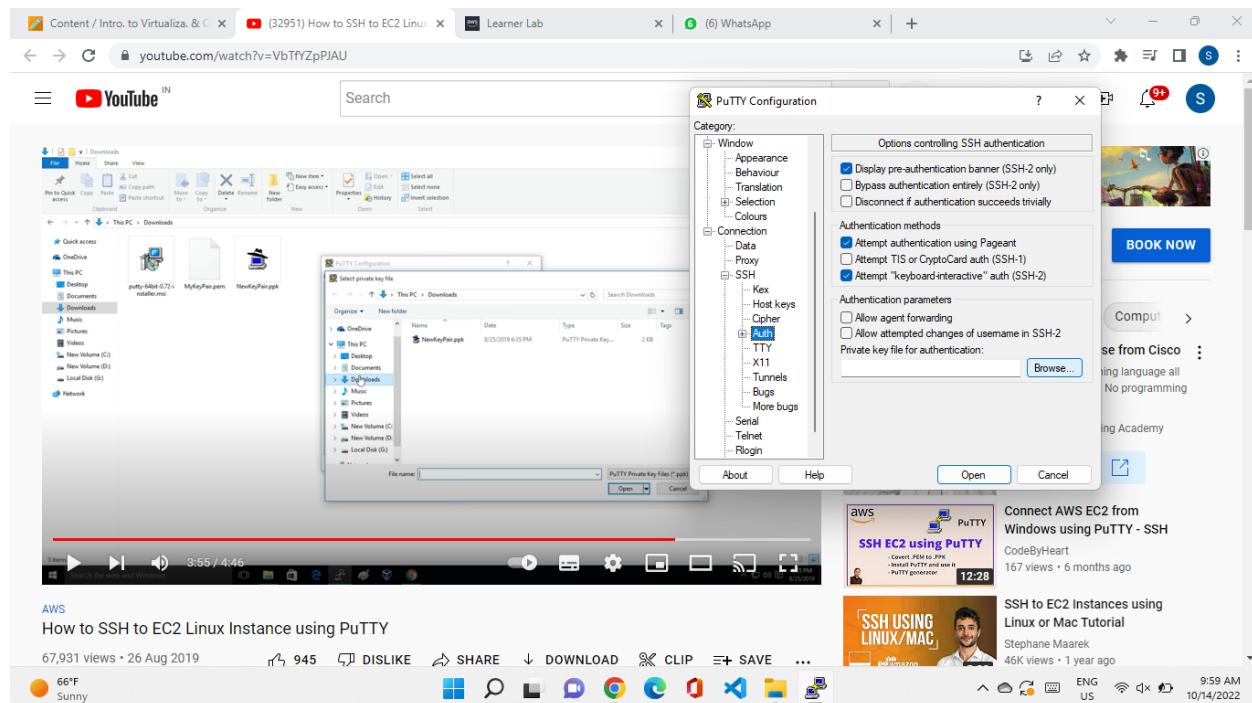
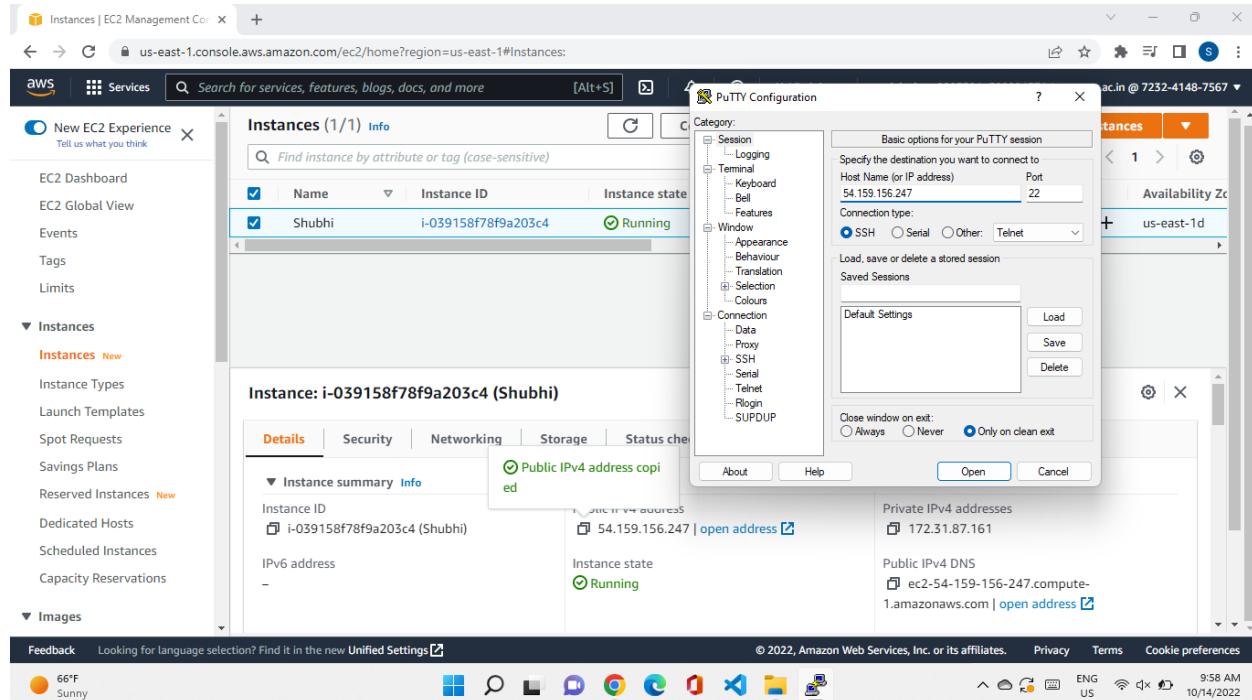


## Step 11: Select your private key file (.pem) and click Open.

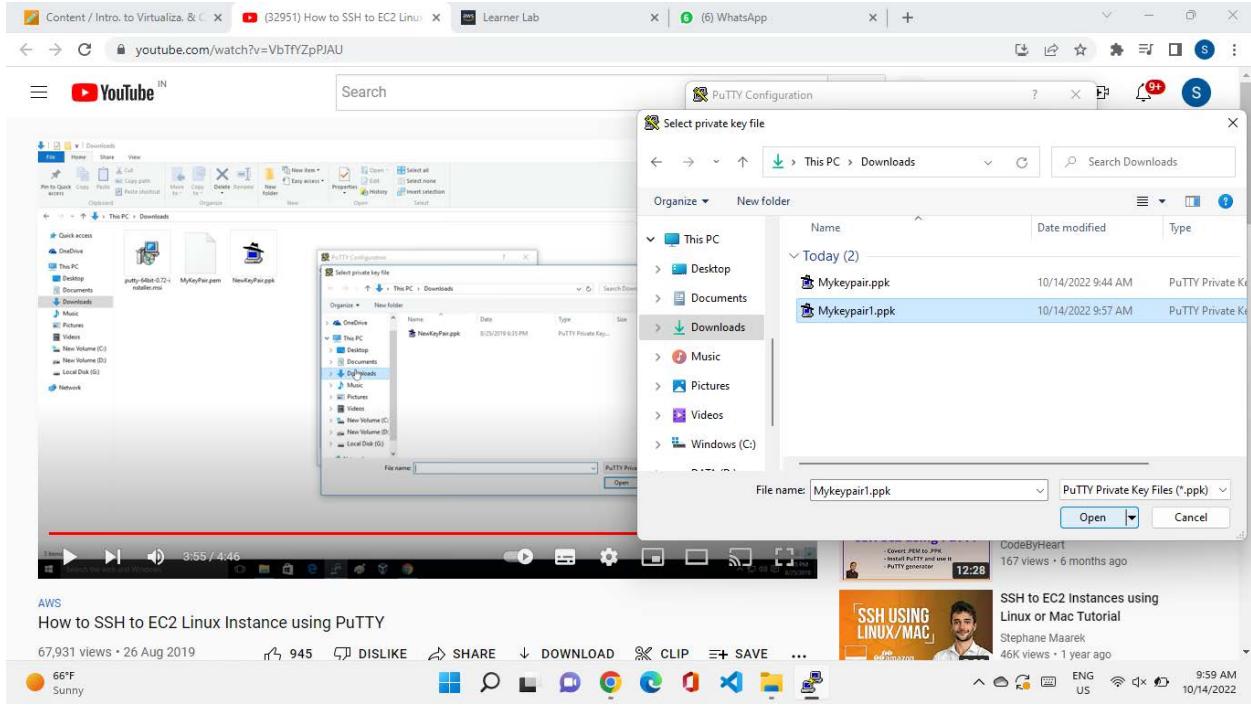




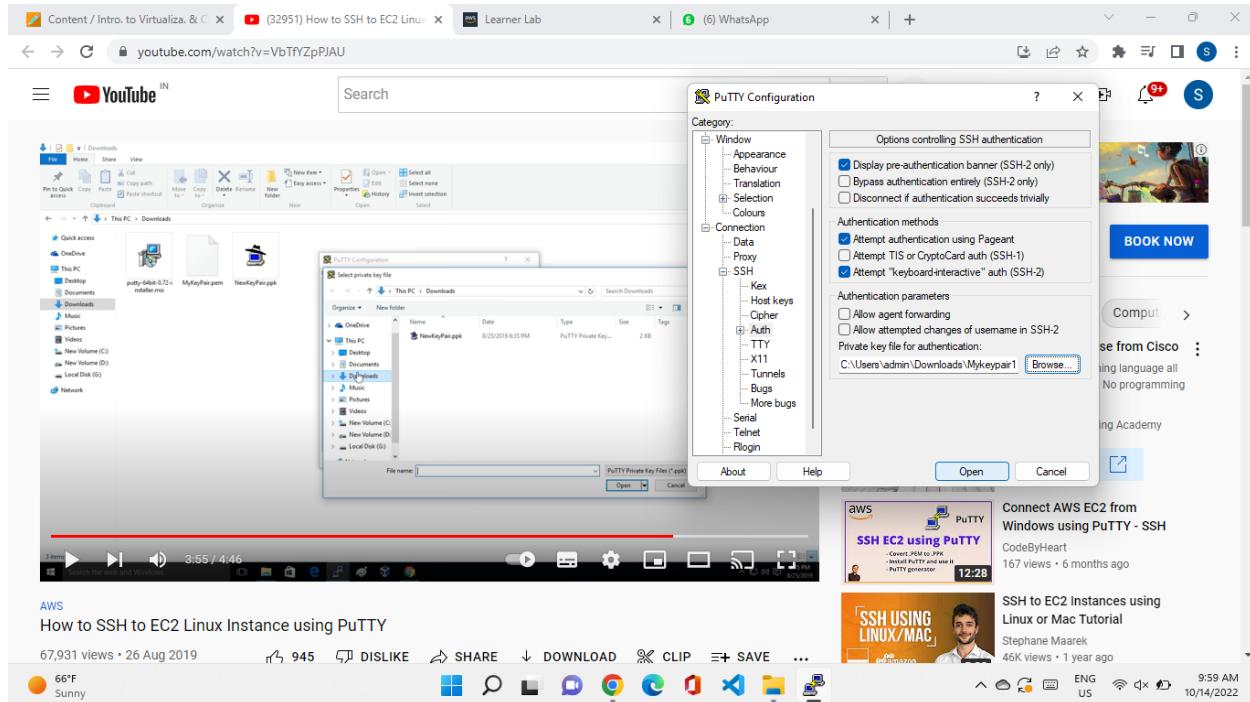
## Step 12: Now choose PUTTY configuration



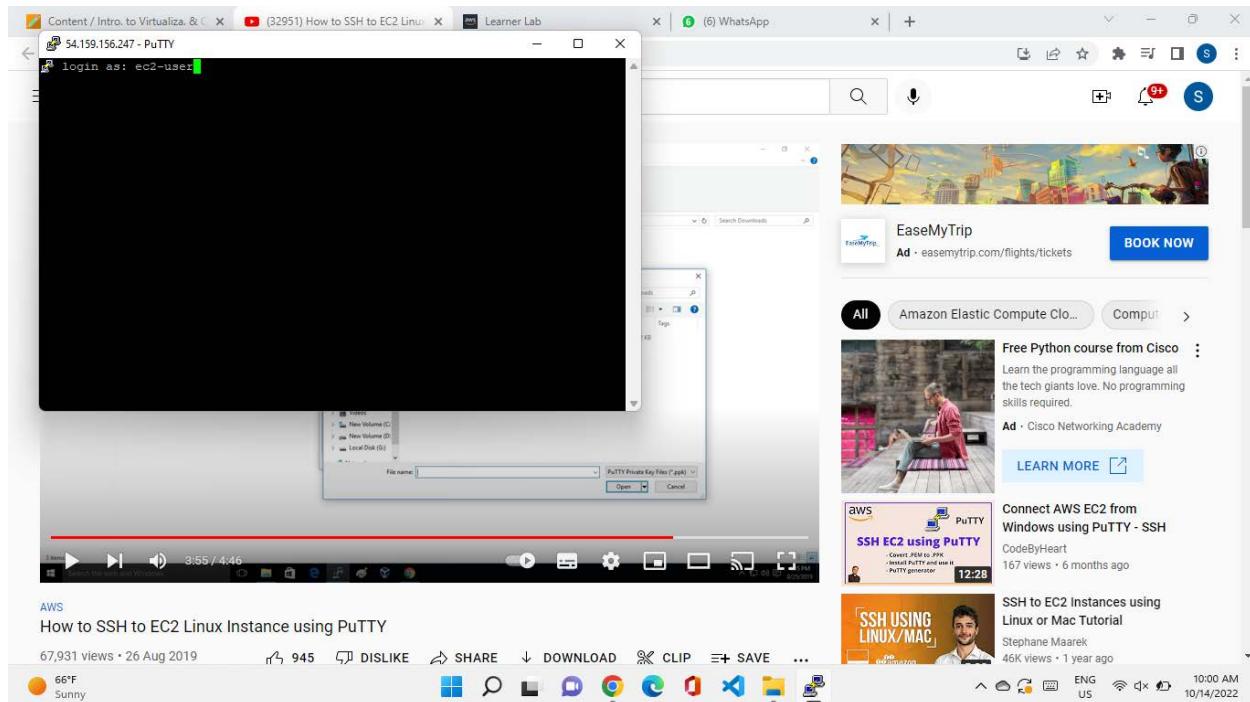
Step 13: Navigate to the location you want to store your PuTTY Private Key file (.ppk) and give it a name. Click **Save**.

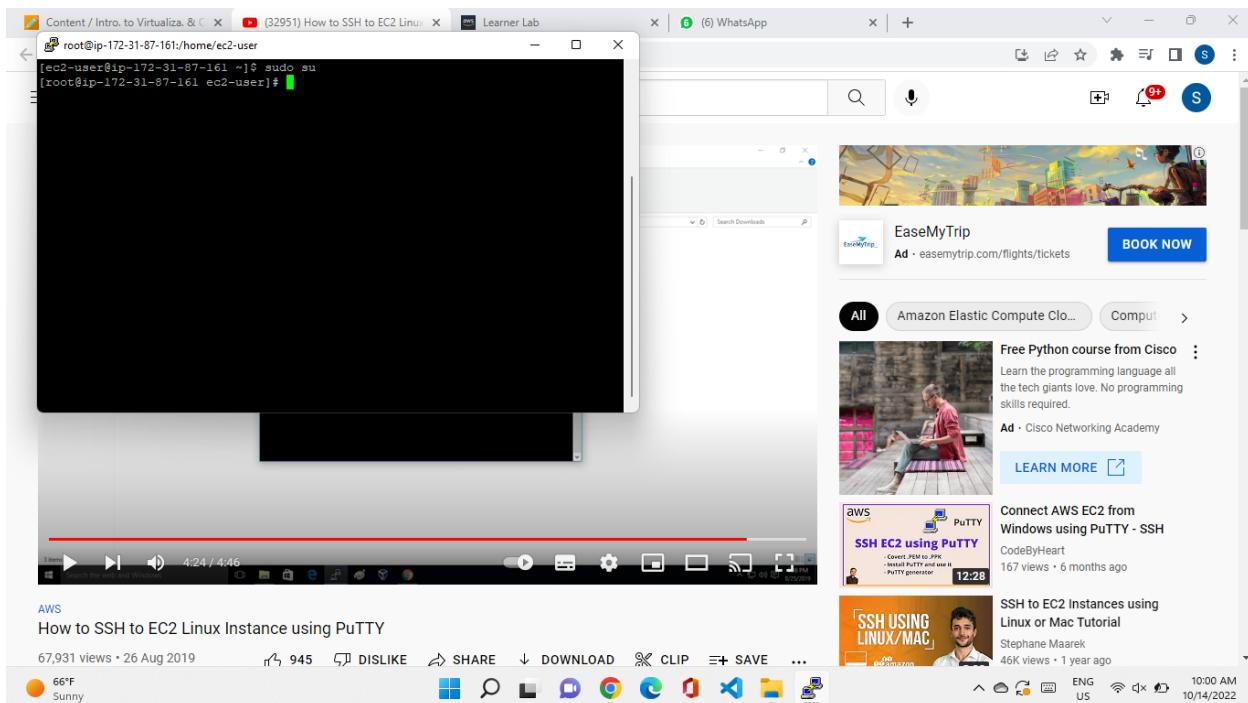
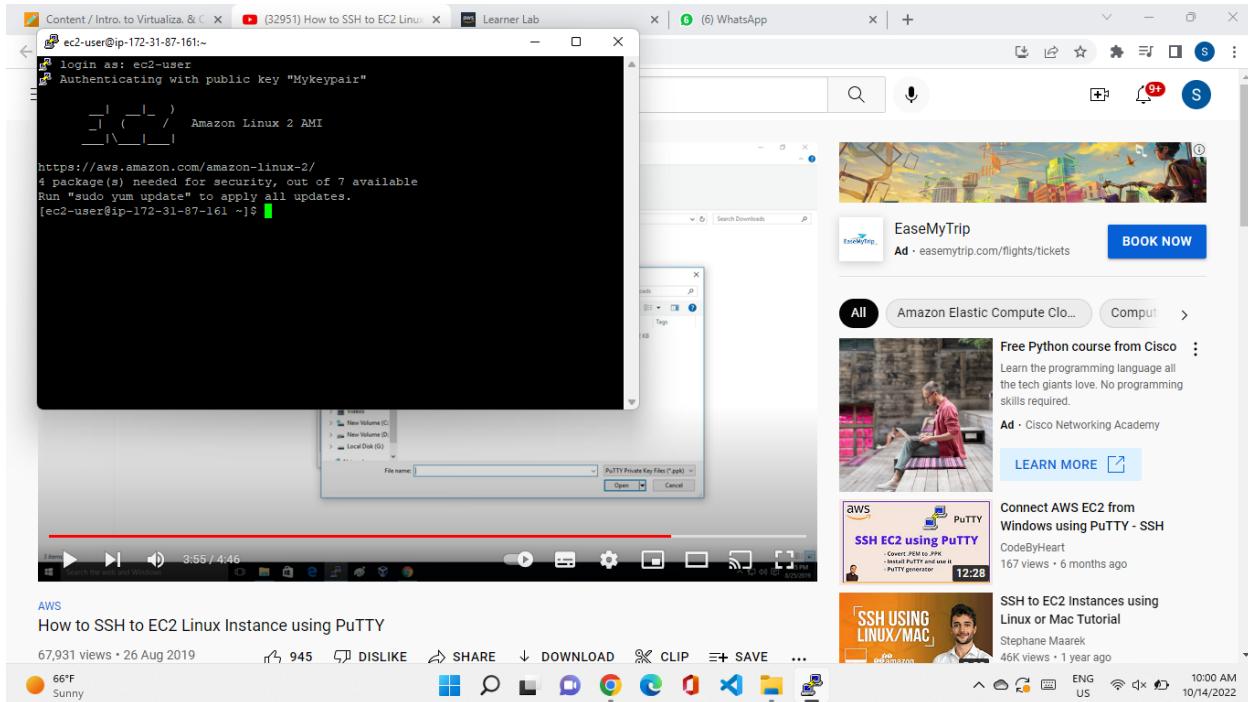


Click **Open** in PuTTY Configuration to connect to your Instance.



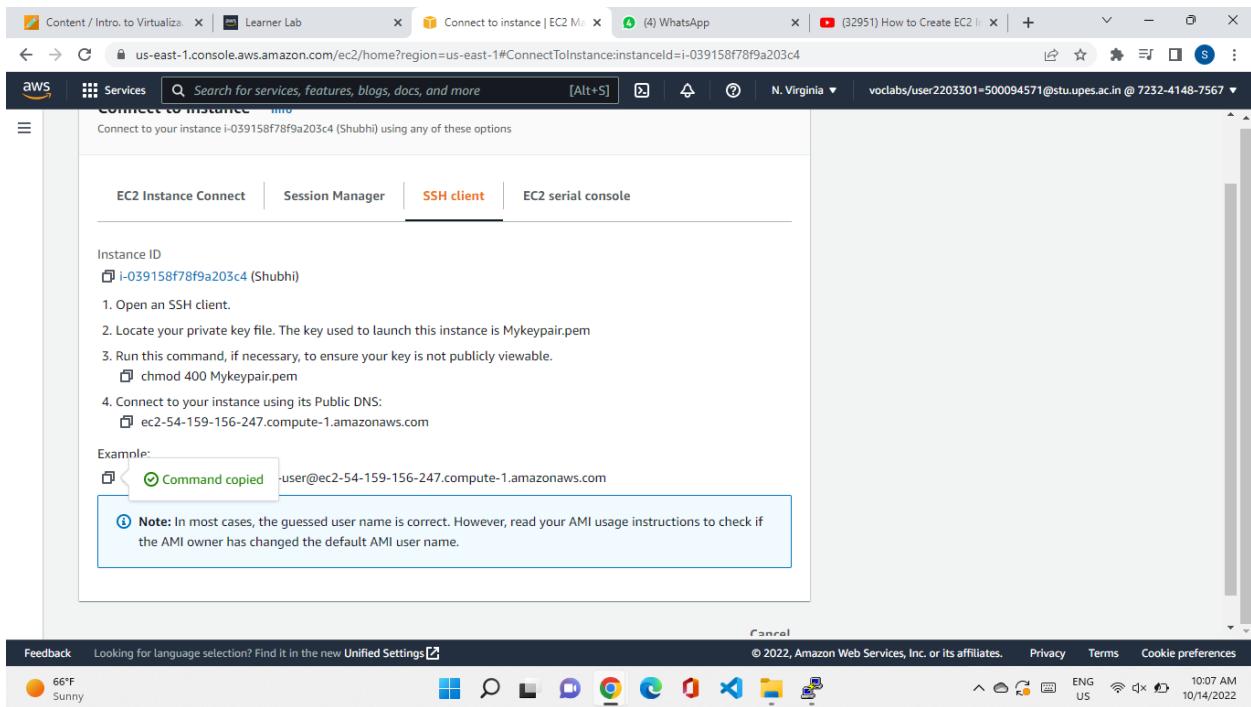
The EC2 Instance window will appear





# Create an AMI from an Amazon EC2 Instance

**Step 1:** Right-click the instance you want to use as the basis for your AMI, and choose **Create Image** from the context menu. Click on SSH client. Copy that command



**Step 2:** Paste the copied command in command prompt, your instance will be created.

The screenshot shows the AWS Lambda console interface. At the top, there are several tabs and a search bar. On the left, a sidebar lists services like Reserved Instances, Images, Elastic Block Store, Network & Security, and Load Balancing. The main area is titled "Amazon Machine Images (AMIs) (1/1)" and shows a single AMI entry:

Name	AMI ID	AMI name	Source	Owner
-	ami-060b15750e5beecd	Aws linux	723241487567/Aws linux	723241487567

Below this, a detailed view for the AMI ID "ami-060b15750e5beecd" is shown with the following information:

AMI ID	Image type	Platform details	Root device type
ami-060b15750e5beecd	machine	Linux/UNIX	EBS
AMI name	Owner account ID	Architecture	Usage operation
Aws linux	723241487567	x86_64	RunInstances
Root device name	Status	Source	Virtualization type
/dev/xvda	Pending	723241487567/Aws linux	hvm

At the bottom, there are links for Feedback, Unified Settings, Privacy, Terms, and Cookie preferences.

The screenshot shows the AWS EC2 Management console. The left sidebar includes the "New EC2 Experience" button and links for EC2 Dashboard, Global View, Events, Tags, and various instance-related services like Instances, Instance Types, Launch Templates, and Reserved Instances. The main area displays the "Instances (2) Info" section with two running instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
Shubhi	i-039158f78f9a203c4	Running	t2.micro	2/2 checks passed	No alarms	us-east-1d
AMi	i-06d76f66fab8c19b0	Running	t2.micro	-	No alarms	us-east-1d

Below this, a "Select an instance" dialog box is open. At the bottom, there are links for Feedback, Unified Settings, Privacy, Terms, and Cookie preferences, along with a "Show all" button.

