

CS 524 Introduction to Cloud Computing

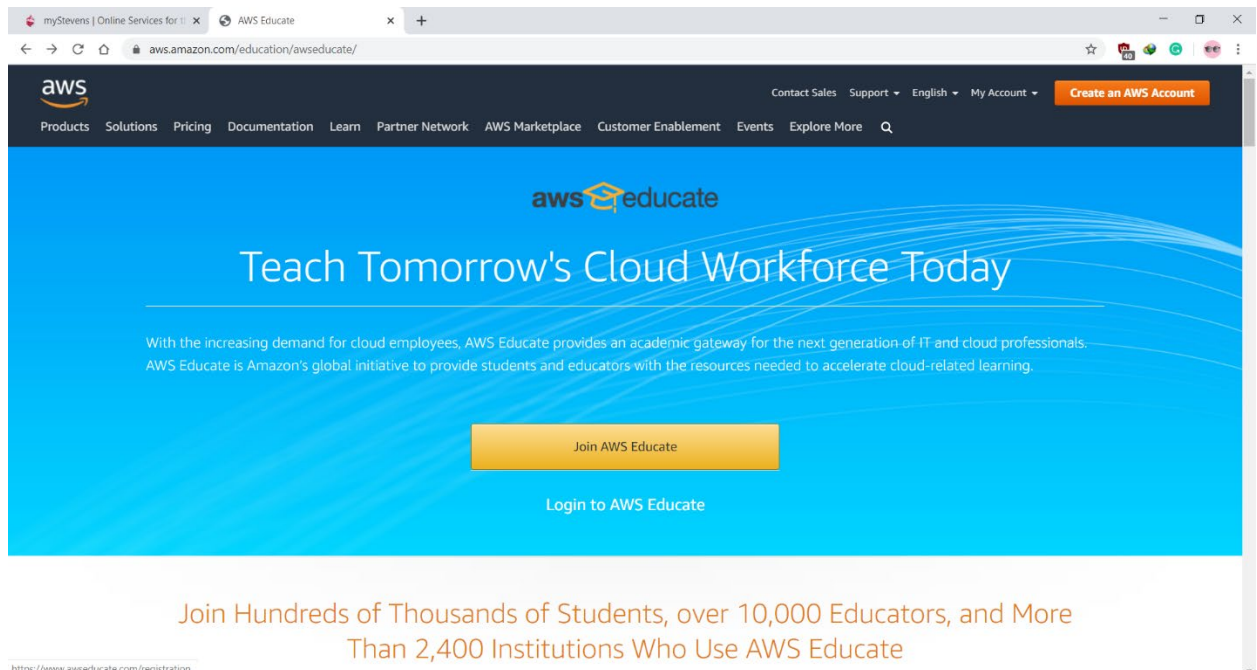
Dharmit Viradia

Lab Assignment 1

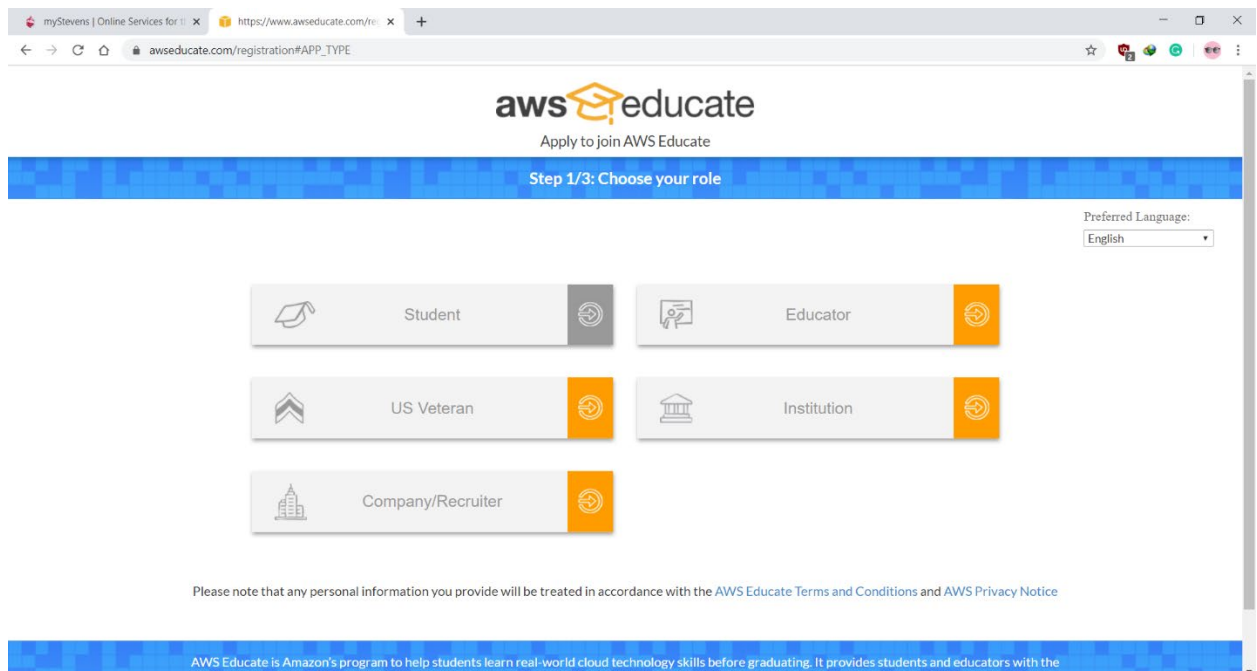
Prof. Igor Faynberg

Step for Creating an AWS account

- Signup for AWS Educate for Students



- Choose Role as Student



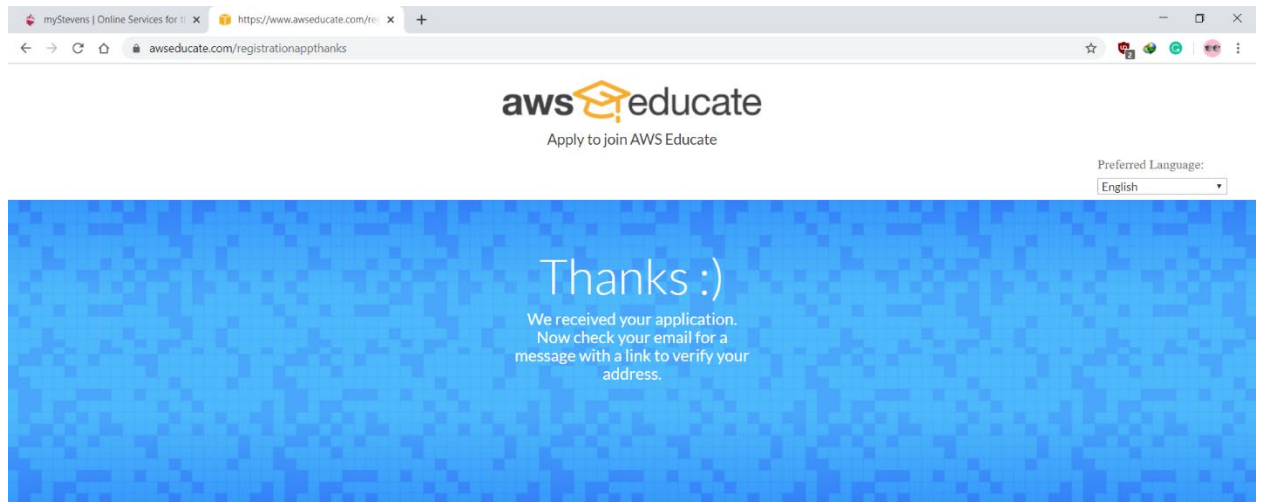
- Fill in Student Details

The screenshot shows the AWS Educate registration page for a student. The browser address bar displays 'https://www.awseducate.com/registration#INFO-Student'. The form includes fields for 'Stevens Institute of Technology' (with a dropdown arrow), 'United States' (with a dropdown arrow), 'First Name', 'Last Name', 'Email' (with a note: 'Please provide a valid, current email issued by your institution. Example: your_name@your_school.edu'), 'Graduation Month' (with a dropdown arrow), 'Graduation Year' (with a dropdown arrow), 'Birth Month' (with a dropdown arrow), 'Birth Year' (with a dropdown arrow), and 'Promo Code (optional)'. A 'Frequently Asked Questions' link is present. Below the form is a CAPTCHA section with a green checkmark and the text 'I'm not a robot'. A note states: 'Please note that any personal information you provide will be treated in accordance with the AWS Educate Terms and Conditions and AWS Privacy Notice'. At the bottom is an orange 'NEXT' button with a right arrow icon.

- Agree to terms and condition

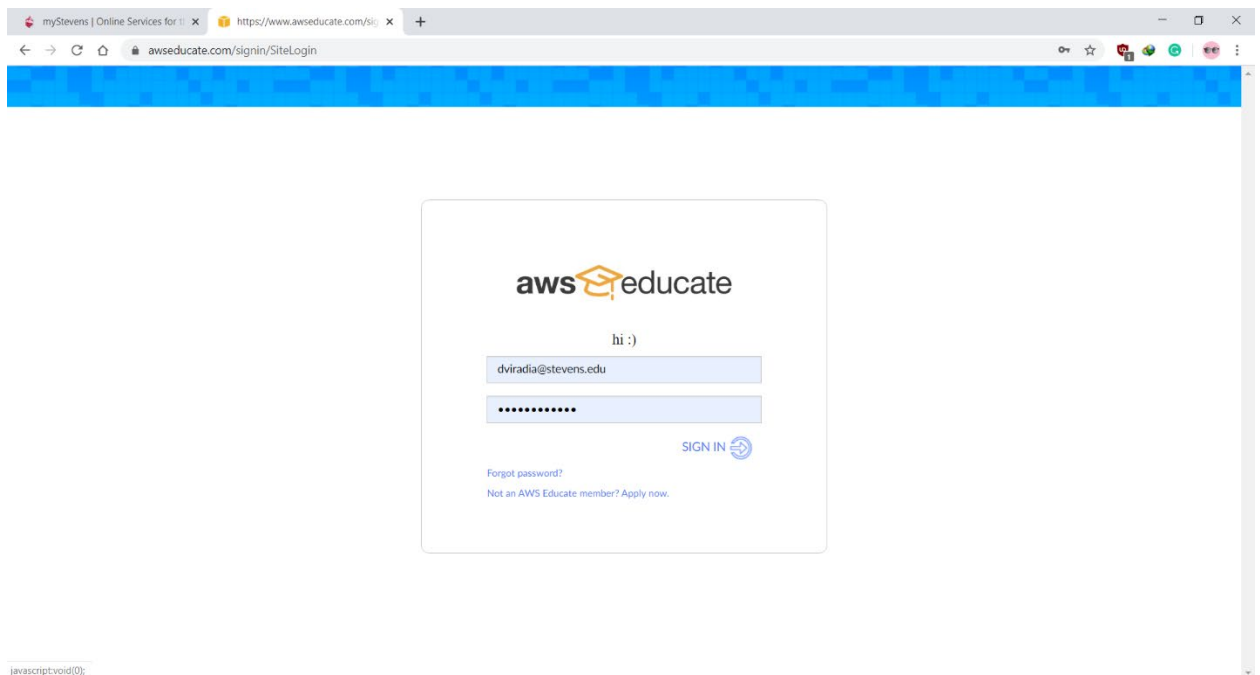
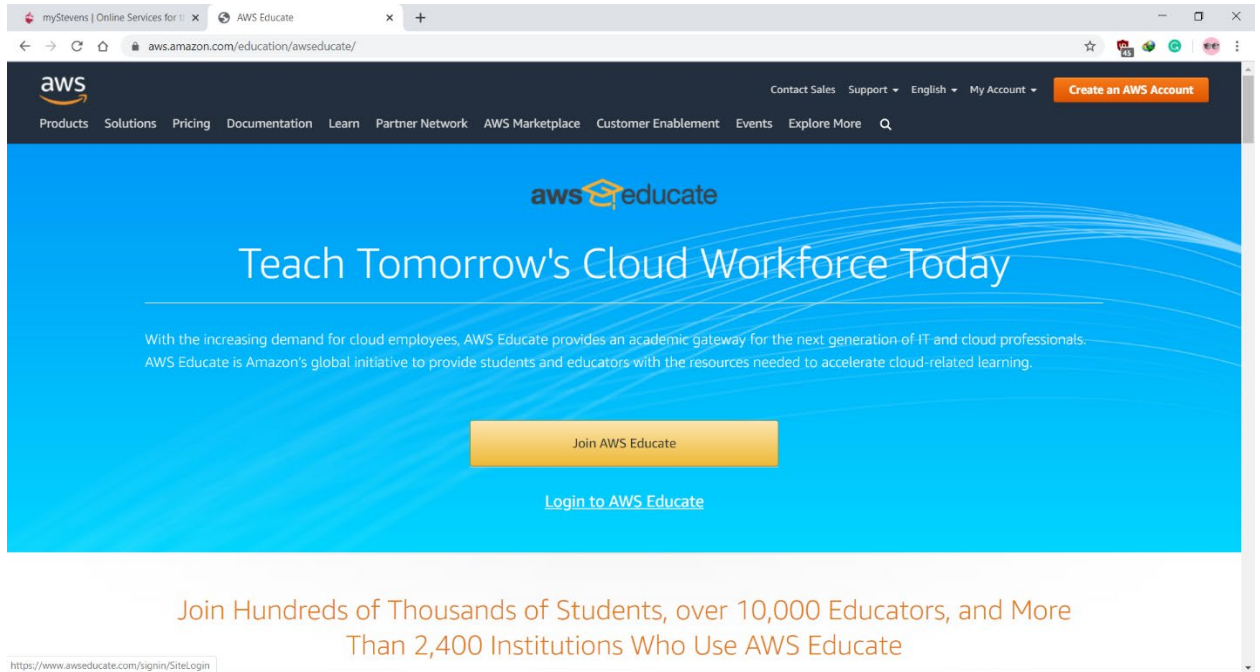
The screenshot shows the AWS Educate 'Terms & Conditions' page. The browser address bar displays 'https://www.awseducate.com/registration#T_AND_C-Student'. The page features the AWS Educate logo and the text 'Apply to join AWS Educate'. A blue banner with the text 'Terms & Conditions' is visible. On the right, there is a 'Preferred Language:' dropdown menu set to 'English'. The main content area contains the text: 'English language version of this Agreement will control if there is any conflict.' followed by '10.0. CONTRACTING ENTITY' and 'Notwithstanding anything to the contrary in these Terms:'. Below this, section '10.1 India Customers' describes the contracting party for users in India. It includes two sub-points: (a) referring to the Amazon.com Privacy Notice and (b) referring to the Amazon.in Privacy Notice. At the bottom, a note states: 'You must scroll through the entire Terms and Conditions before accepting or declining.' There are two buttons: 'I Agree' (orange) and 'I Decline' (blue). At the very bottom is an orange 'SUBMIT' button with a right arrow icon.

- Verify mail and Set Password

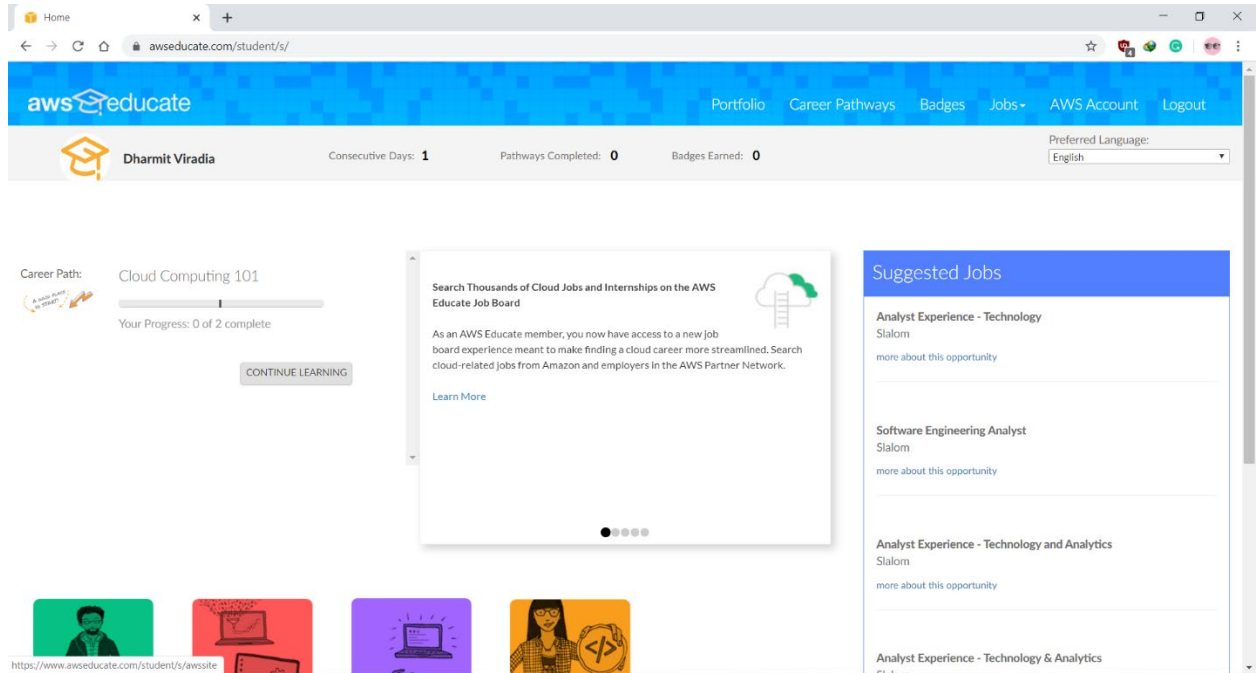


Step for Creating and Launching AWS instance

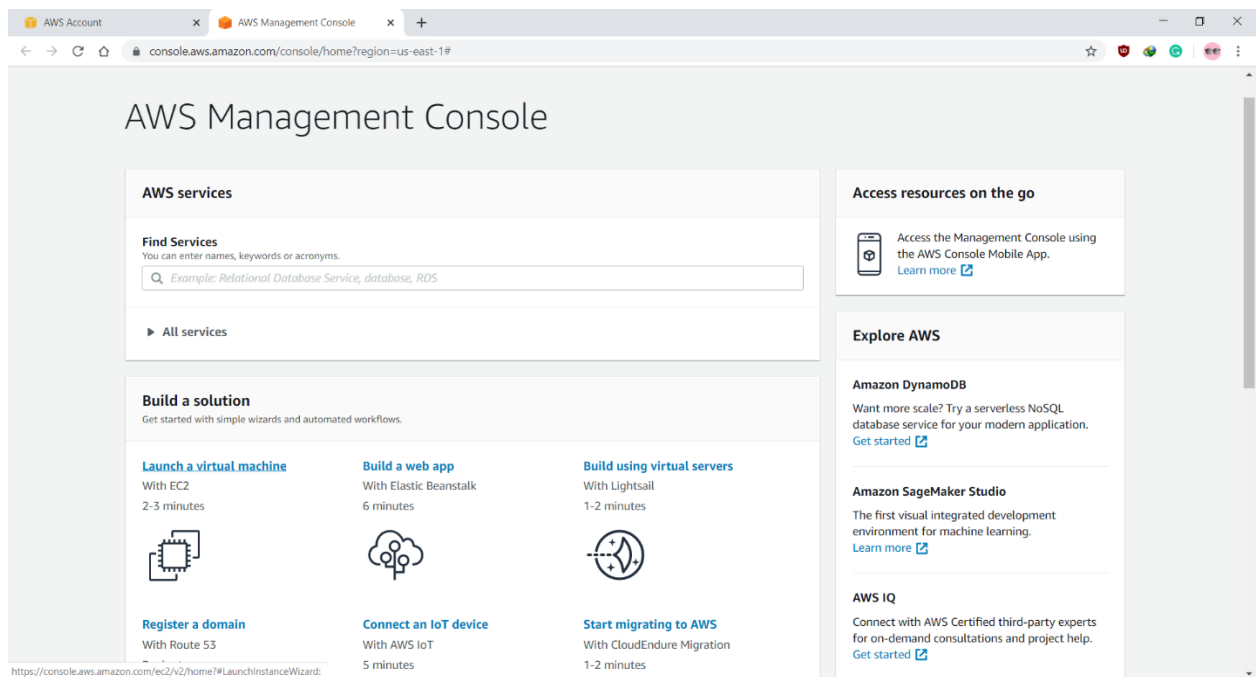
- Login to AWS Educate Account



- Go to AWS Account



- Launch Virtual Machine



- Select Amazon Linux AMI

Step 1: Choose an Amazon Machine Image (AMI)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

Search for an AMI by entering a search term e.g. "Windows"

Quick Start

- My AMIs
- AWS Marketplace
- Community AMIs
- Free tier only

Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0a887e401f7654935 (64-bit x86) / ami-002cc39e7bf021a77 (64-bit Arm)

Amazon Linux 2 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.

Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Amazon Linux AMI 2018.03.0 (HVM), SSD Volume Type - ami-0e2ff28bfb72a4e45

The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.

Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Red Hat Enterprise Linux 8 (HVM), SSD Volume Type - ami-0c322300a1dd5dc79 (64-bit x86) / ami-03587fa4048e9eb92 (64-bit Arm)

Red Hat Enterprise Linux version 8 (HVM), EBS General Purpose (SSD) Volume Type

Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

SUSE Linux Enterprise Server 15 SP4 (HVM), SSD Volume Type - ami-0d6cfabba4385b7 (64-bit x86) / ami-0a92f5f5e9b32879d0 (64-bit Arm)

- Select Type t2.micro and review and launch

Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. [Learn more](#) about instance types and how they can meet your computing needs.

Filter by: All Instance types Current generation Show/Hide Columns

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.micro	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes
<input type="checkbox"/>	General purpose	t2.2xlarge	8	32	EBS only	-	Moderate	Yes
<input type="checkbox"/>	General purpose	t3a.nano	2	0.5	EBS only	Yes	Up to 5 Gigabit	Yes

Cancel Previous **Review and Launch** Next: Configure Instance Details

- Launch EC2 Instance

Step 7: Review Instance Launch
Please review your Instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

AMI Details [Edit AMI](#)

Amazon Linux AMI 2018.03.0 (HVM), SSD Volume Type - ami-0e2ff28bfb72a4e45
Free tier eligible
The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.
Root Device Type: ebs Virtualization type: hvm

Instance Type [Edit instance type](#)

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.micro	Variable	1	1	EBS only	-	Low to Moderate

Security Groups [Edit security groups](#)

Security group name launch-wizard-1
Description launch-wizard-1 created 2020-02-18T17:11:33.907-05:00

Type	Protocol	Port Range	Source	Description
This security group has no rules				

[Cancel](#) [Previous](#) [Launch](#)

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- Create Key Pair

Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Create a new key pair
Key pair name

[Download Key Pair](#)

You have to download the private key file (*.pem file) before you can continue. Store it in a secure and accessible location. You will not be able to download the file again after it's created.

[Cancel](#) [Launch Instances](#)

[Cancel](#) [Previous](#) [Launch](#)

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- EC2 Instance is Ready

The screenshot shows the AWS Management Console interface. At the top, there's a navigation bar with the AWS logo, 'Services', 'Resource Groups', and a user profile 'vocstartsoft/user453140=dvira...'. The main content area is titled 'Launch Status'. It features a green success message: 'Your instances are now launching' with a checkmark icon. Below this, it says 'The following instance launches have been initiated: i-Ofee059b5cfac8c9' and provides a link to 'View launch log'. There's also a blue information message: 'Get notified of estimated charges' with an 'i' icon, explaining that users can create billing alerts. The section 'How to connect to your instances' explains that instances will be in the 'running' state and provides instructions on how to connect. It includes a dropdown menu for 'Here are some helpful resources to get you started' with links to 'How to connect to your Linux instance', 'Learn about AWS Free Usage Tier', 'Amazon EC2: User Guide', and 'Amazon EC2: Discussion Forum'. A section titled 'While your instances are launching you can also' lists tasks like 'Create status check alarms', 'Create and attach additional EBS volumes', and 'Manage security groups'. The footer contains 'Feedback', 'English (US)', and copyright information.

Launch Status

✓ Your instances are now launching
The following instance launches have been initiated: i-Ofee059b5cfac8c9 [View launch log](#)

i Get notified of estimated charges
Create billing alerts to get an email notification when estimated charges on your AWS bill exceed an amount you define (for example, if you exceed the free usage tier).

How to connect to your instances

Your instances are launching, and it may take a few minutes until they are in the **running** state, when they will be ready for you to use. Usage hours on your new instances will start immediately and continue to accrue until you stop or terminate your instances.

Click **View Instances** to monitor your instances' status. Once your instances are in the **running** state, you can **connect** to them from the Instances screen. [Find out](#) how to connect to your instances.

▼ Here are some helpful resources to get you started

- [How to connect to your Linux instance](#)
- [Learn about AWS Free Usage Tier](#)
- [Amazon EC2: User Guide](#)
- [Amazon EC2: Discussion Forum](#)

While your instances are launching you can also

- [Create status check alarms](#) to be notified when these instances fail status checks. (Additional charges may apply)
- [Create and attach additional EBS volumes](#) (Additional charges may apply)
- [Manage security groups](#)

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Step for Accessing AWS instance

- Establishing connection with EC2 Instance by executing below command using ssh
`ssh -i "key.pem" ec2-user@ec2-54-87-255-14.compute-1.amazonaws.com`

The screenshot shows the AWS Management Console interface. The left sidebar contains navigation options like EC2 Dashboard, Events, Tags, Reports, Limits, INSTANCES, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations, IMAGES, AMIs, Bundle Tasks, ELASTIC BLOCK STORE, Volumes, Snapshots, and Lifecycle Manager. The main content area displays a table of EC2 instances. One instance is visible with the following details:

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP	IPv6 IP
	i-0fee059b5cface8c9	t2.micro	us-east-1c	running	Initializing	None	ec2-35-153-166-93.co...	35.153.166.93	-

Below the table, the details for the selected instance (i-0fee059b5cface8c9) are shown. The Public DNS is ec2-35-153-166-93.compute-1.amazonaws.com. The instance is in a running state. The description tab is active, showing the instance ID, state, type, and a finding that states 'You may not have permission to access AWS Compute Optimizer'.

The screenshot shows the AWS Management Console interface with a terminal window open. The terminal window displays the command to connect to the EC2 instance via SSH:

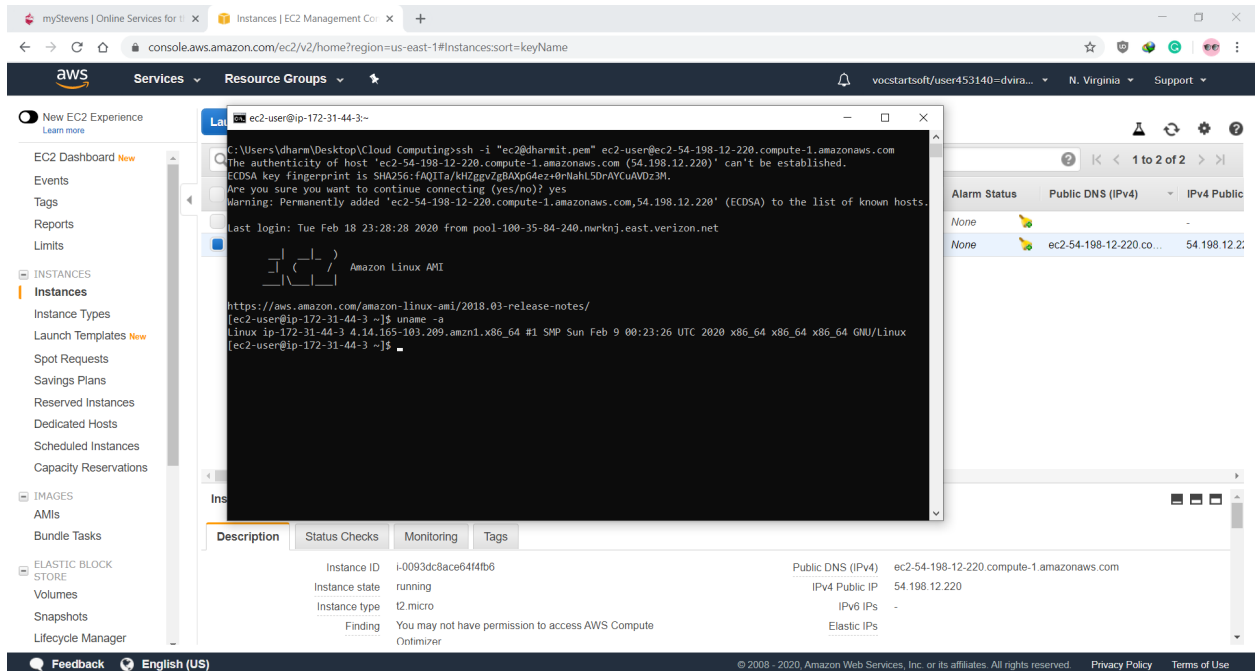
```
ssh -i "key.pem" ec2-user@ec2-54-87-255-14.compute-1.amazonaws.com
```

The output of the command shows the SSH connection details, including the host key fingerprint and the warning to add the host to the list of known hosts. The terminal also shows the last login time and the user's shell prompt.

The background shows the AWS Management Console interface with the EC2 instance details for i-0093dc8ace644f4b6. The instance is in a running state. The description tab is active, showing the instance ID, state, type, and a finding that states 'You may not have permission to access AWS Compute Optimizer'.

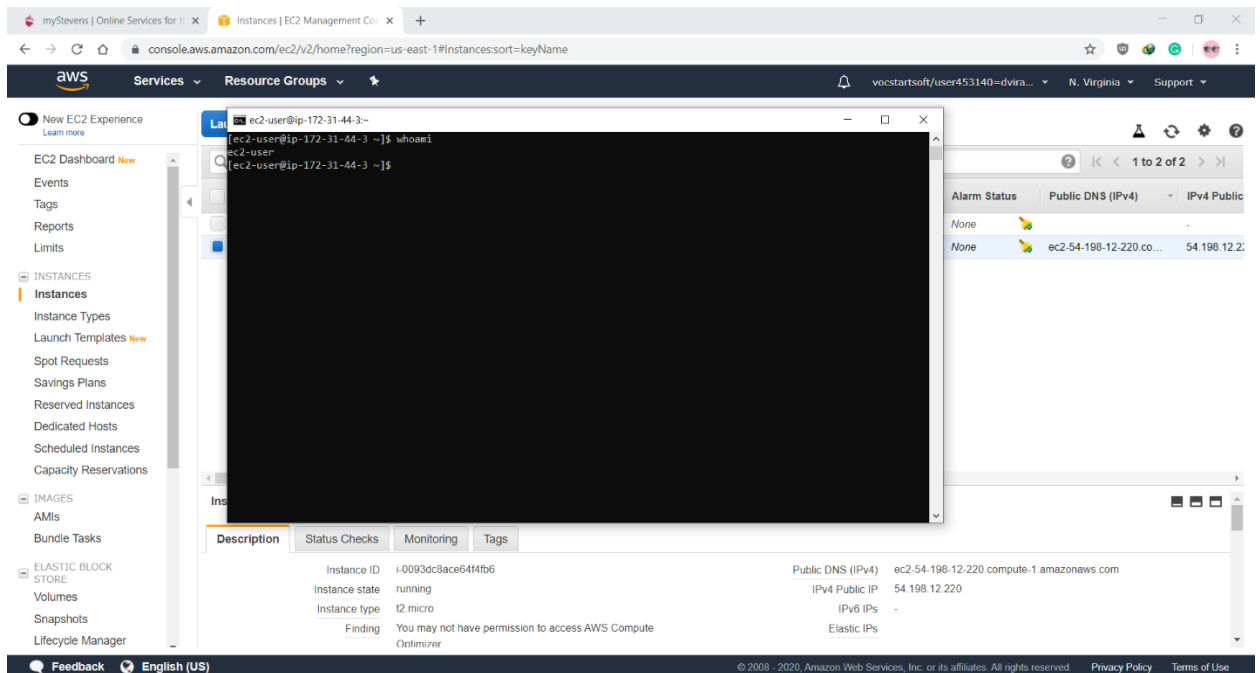
AWS instance Commands

- `uname -a`



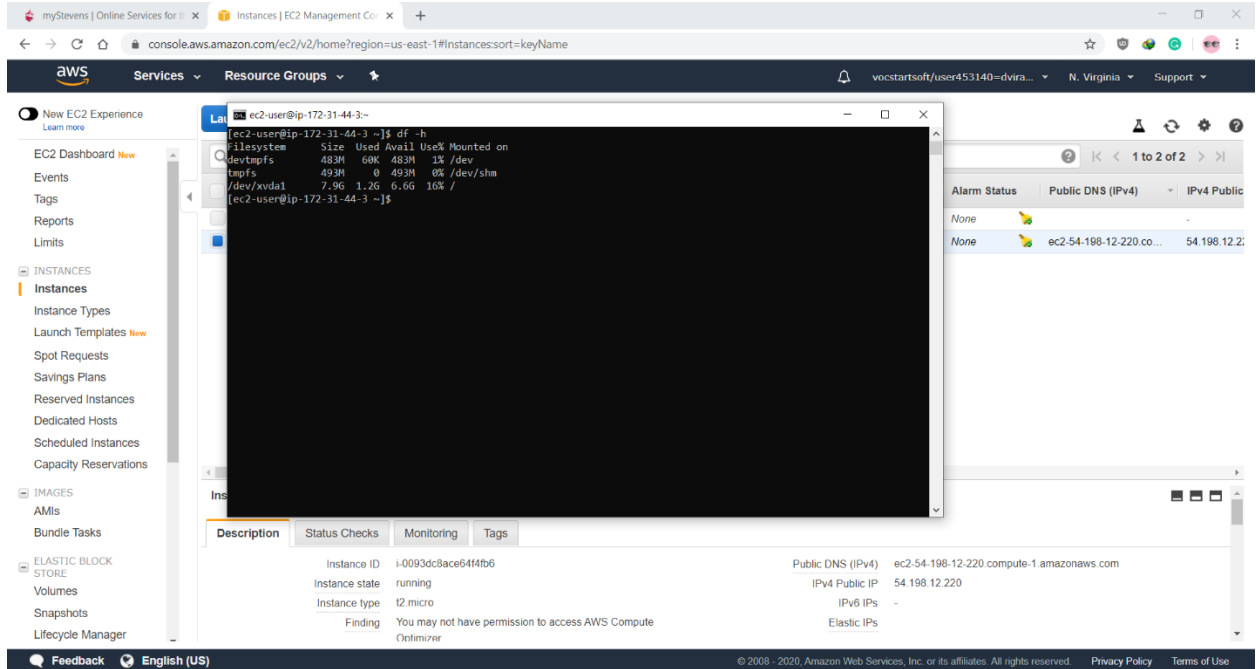
Print information about the current system -a prints all information

- `whoami`



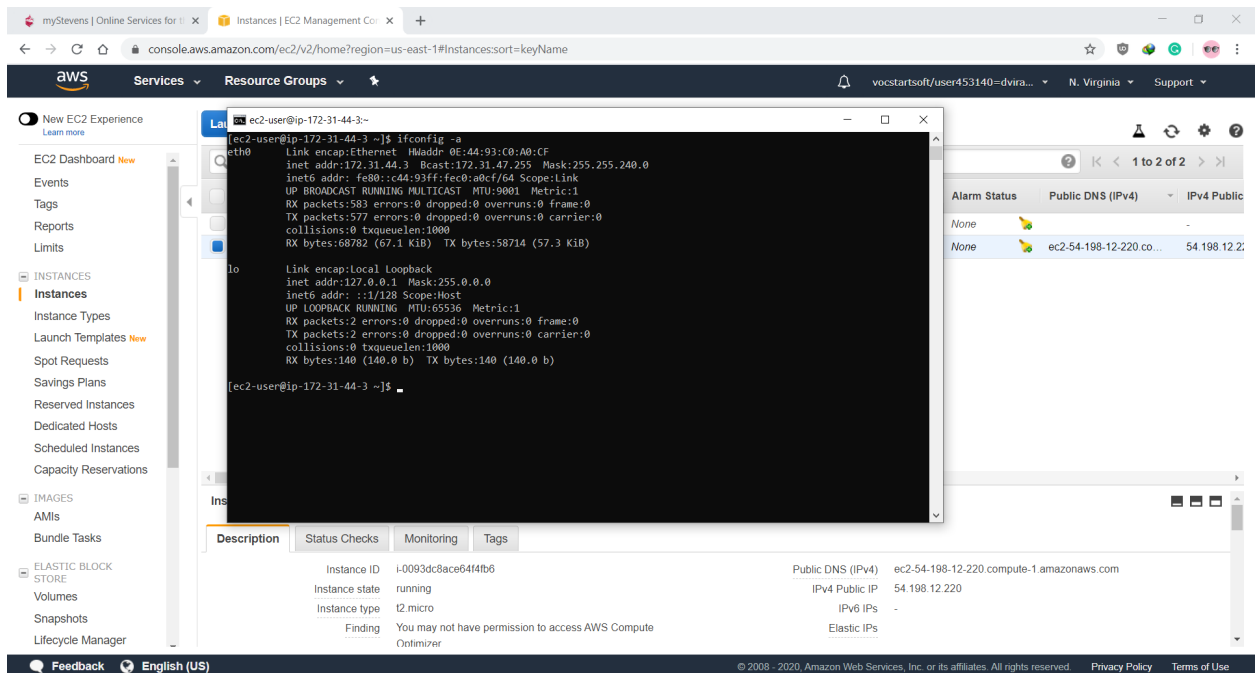
whoami prints the effective user ID

- `df -h`



`df` displays the amount of disk space available on the file system containing each file name argument, `-h` print sizes in human readable format.

- `ifconfig -a`



`ifconfig -a`: it displays the status of all interfaces, even those that are down

- netstat

The screenshot displays the AWS Management Console interface. A terminal window titled 'Select ec2-user@ip-172-31-44-3~' is open, showing the output of the `netstat` command. The output is divided into two sections: 'Active Internet connections (w/o servers)' and 'Active UNIX domain sockets (w/o servers)'. The first section shows a single established connection to `pool-100-35-84-240.mu:55198`. The second section shows various system sockets, including `/dev/log` and `/var/run/dbus/system_bus_socket`, many of which are in a 'CONNECTED' state.

Below the terminal window, the console shows details for an EC2 instance with ID `i-0093dc8ace64f4fb6`. The instance is in a 'running' state, of type `t2.micro`. The public DNS is `ec2-54-198-12-220.compute-1.amazonaws.com` and the public IP is `54.198.12.220`. A finding indicates a permission issue: 'You may not have permission to access AWS Compute Optimizer'.

Alarm Status	Public DNS (IPv4)	IPv4 Public
None		-
None	ec2-54-198-12-220.co...	54.198.12.220

The `netstat` command is used to print network connections, routing tables, interface statistics, masquerade connections, and multicast memberships.