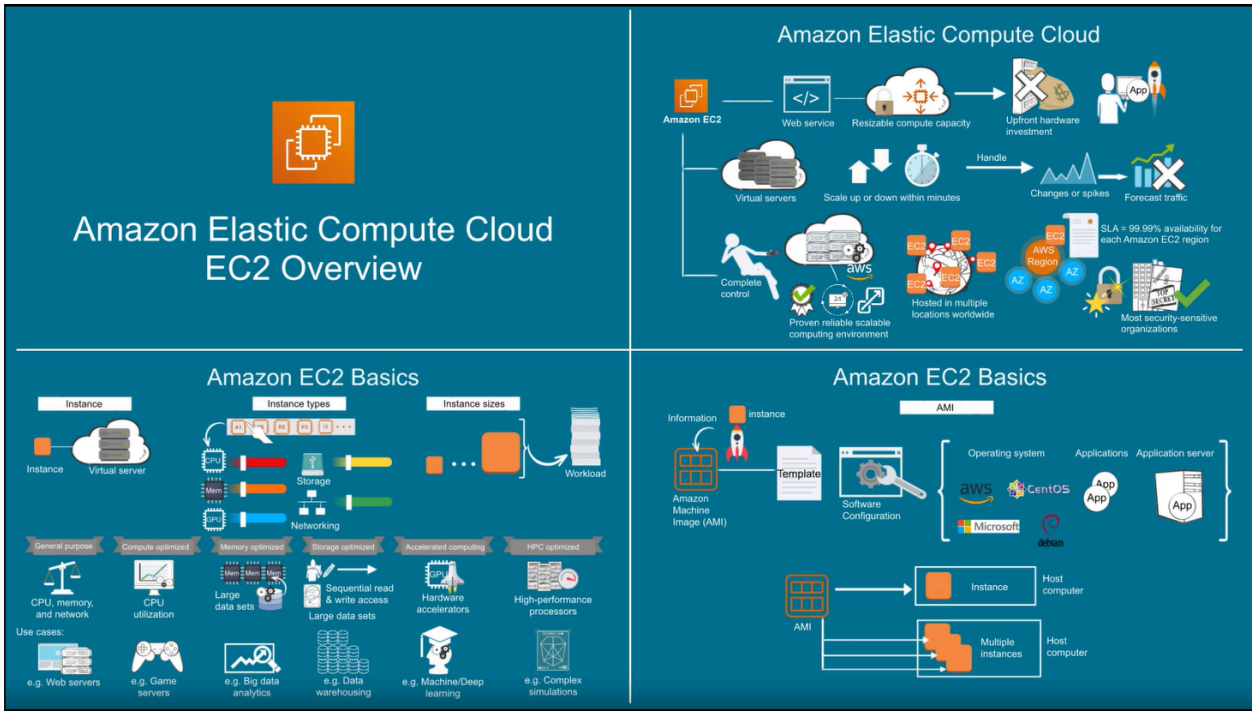
AWS SimuLearn - Computing Solutions

This solution explores different methods for connecting to Amazon EC2 instances and retrieving instance data.

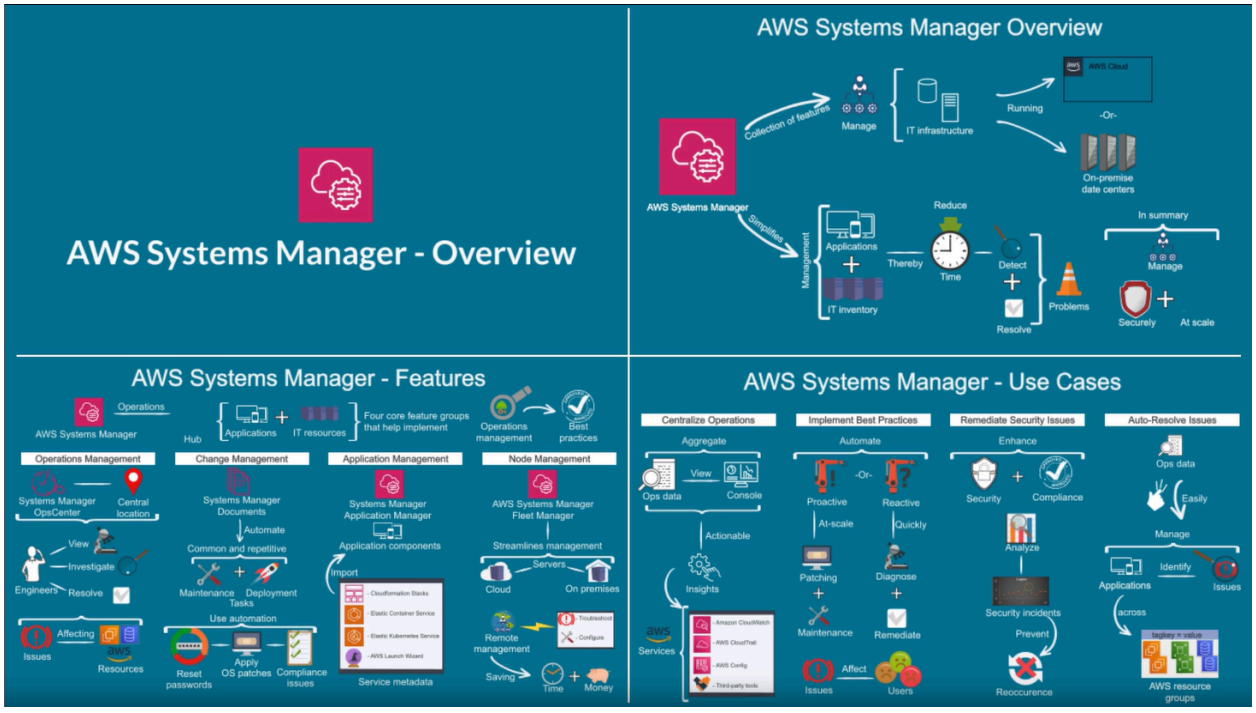
Business Case:
The school wants to upgrade its class scheduling system, currently running on an Amazon EC2 instance, to provide greater computing power and memory capacity.

Services covered:

1. Amazon EC2



2. Amazon System Manager



This solution explores different methods for connecting to Amazon EC2 instances and retrieving instance data.

1. **Session Manager**: Session Manager, a capability of AWS Systems Manager, offers secure node management without requiring inbound ports, bastion hosts, or SSH key management.
2. **SSH using local Terminal:** SSH connectivity through local terminal software provides a traditional access method but requires management and distribution of key pairs.
3. **EC2 connect**: EC2 Instance Connect implements AWS Identity and Access Management (IAM) policies and principals for SSH access control, removing SSH key management requirements.

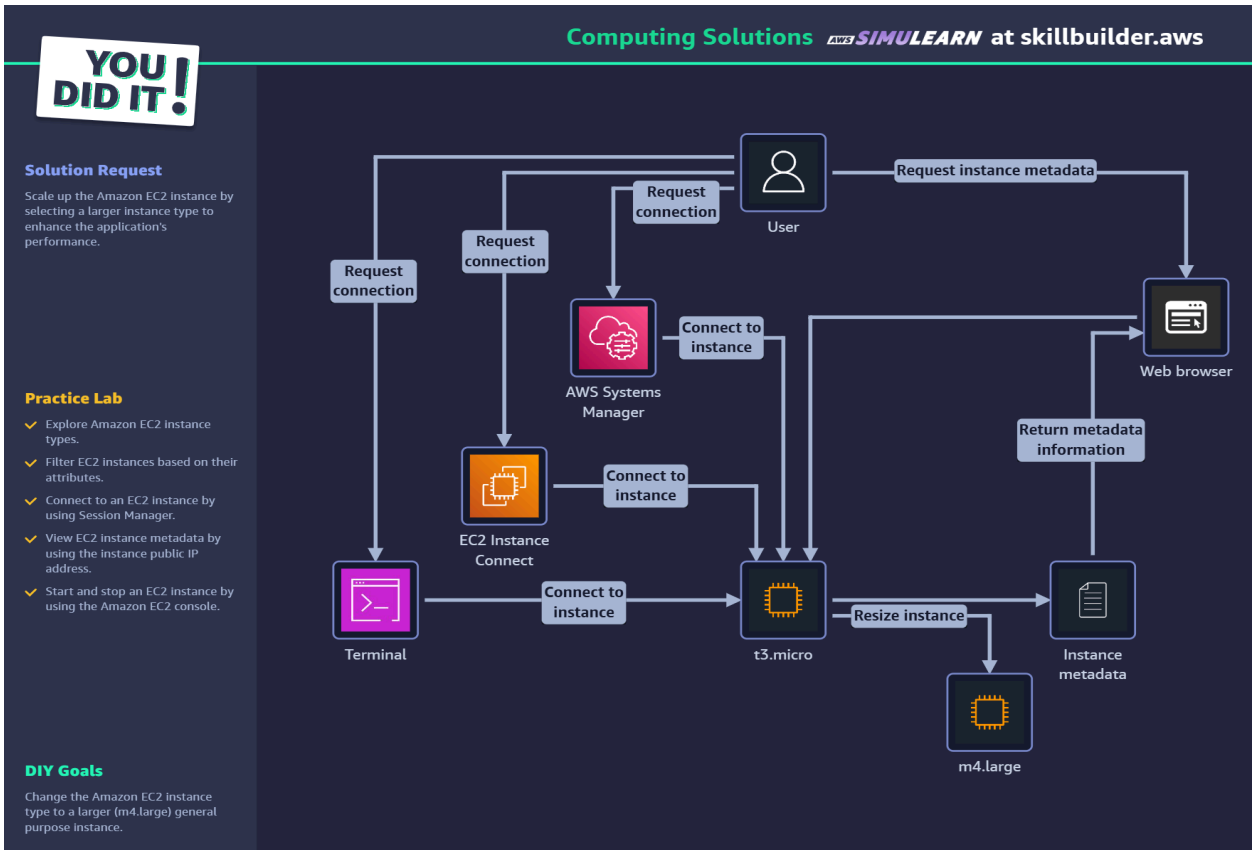
Practice Lab:

Solution Request:

Scale up the Amazon EC2 instance by selecting a larger instance type to enhance the application's performance.

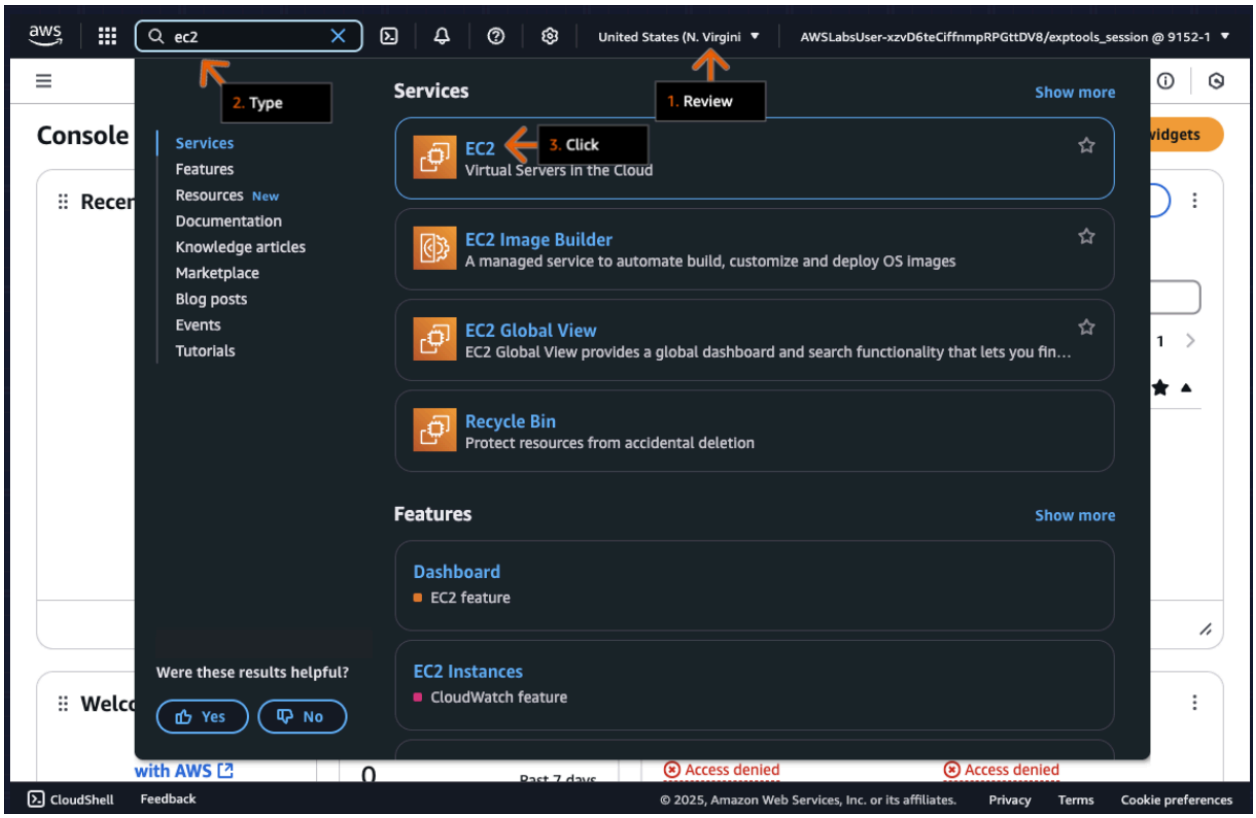
Concepts covered:

- Explore Amazon EC2 instance types.
- Filter EC2 instances based on their attributes.
- Connect to an EC2 instance by using EC2 Instance Connect.
- View EC2 instance metadata by using the instance public IP address.
- Start and stop an EC2 instance by using the Amazon EC2 console.



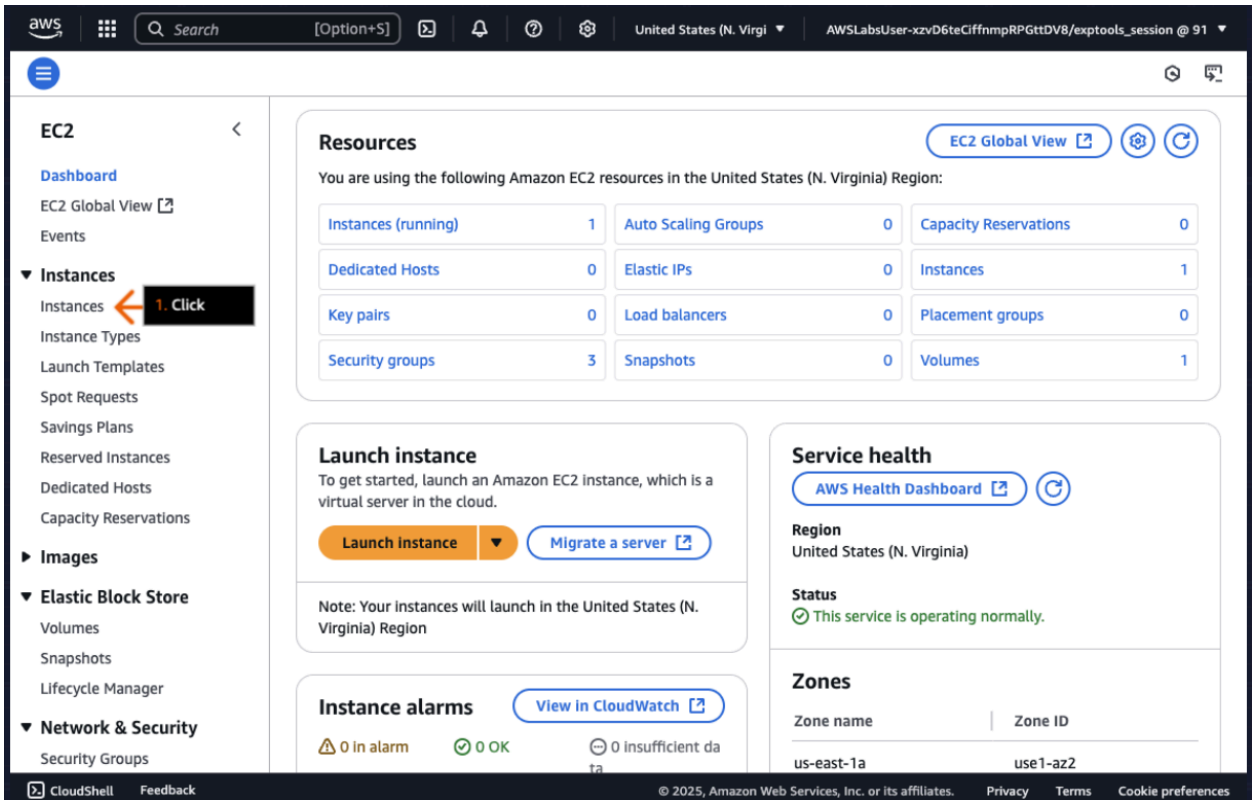
Step-by-Step Guide:

1. On the top navigation bar, review the Region selector to confirm that the Region is set to United State (N. Virginia).
2. In the Services search box, type: ec2
3. In the search results, under Services, click EC2.
4. Go to the next step.



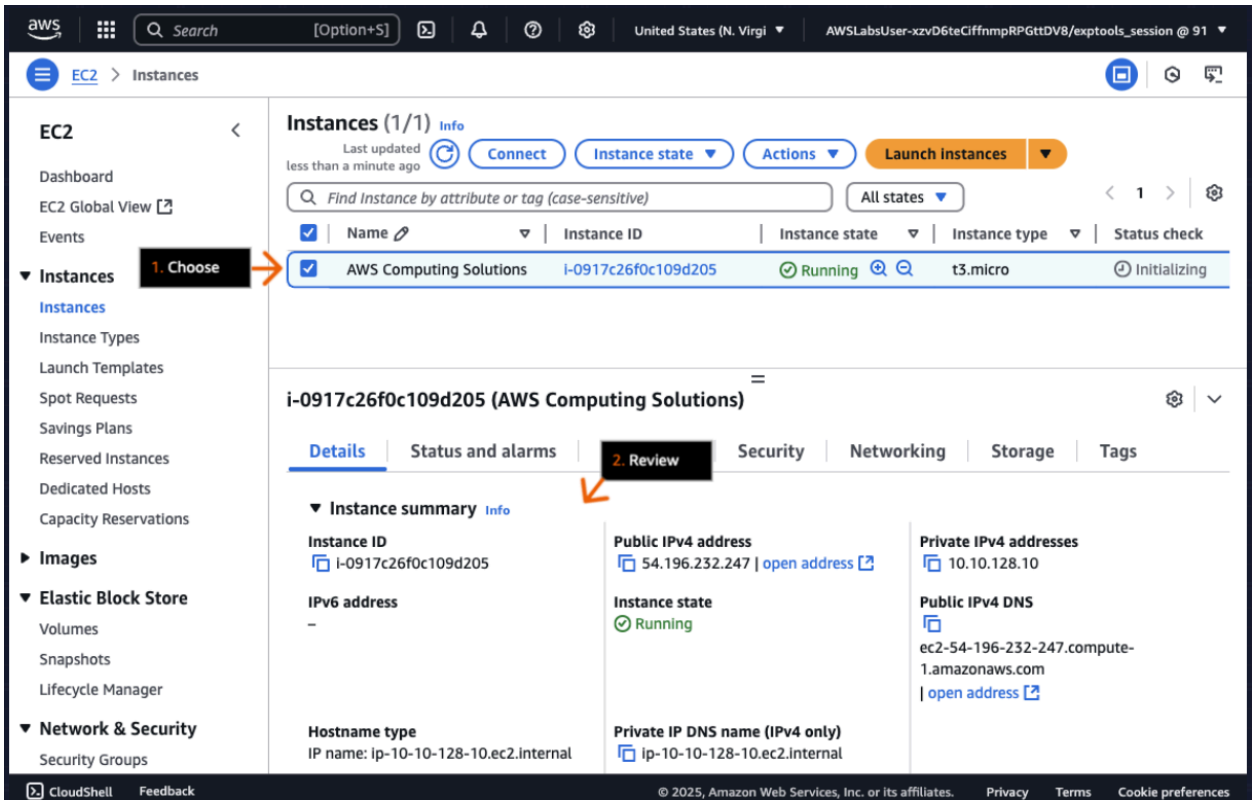
Amazon Elastic Compute Cloud (Amazon EC2) instances provide virtual compute capacity with configurable processor, storage, networking, operating system, and purchase options.

1. In the left navigation pane, click Instances.
2. Go to the next step.



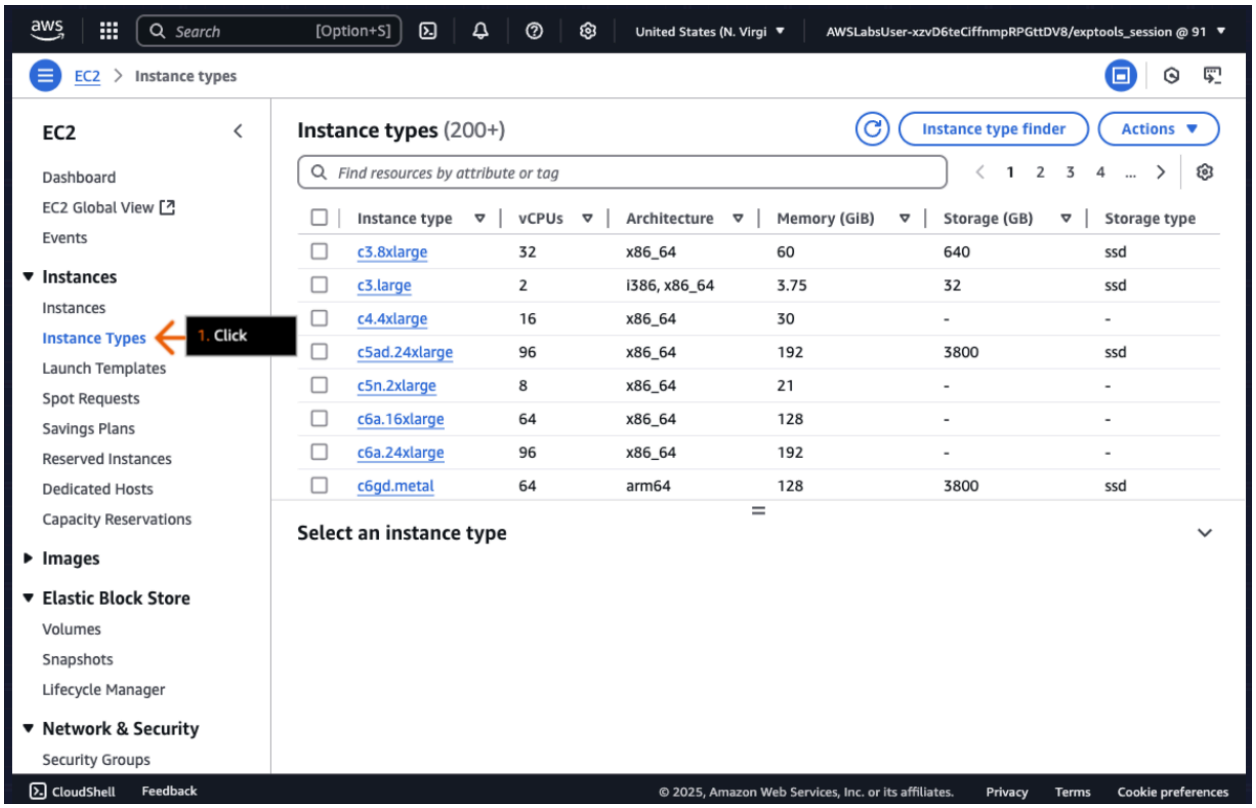
The Details tab displays instance information including public IP, private IP, and public DNS.

1. In the Instances section, choose the checkbox to select the AWS Computing Solutions instance.
2. Below that section, on the Details tab, review the instance details.
3. Go to the next step.



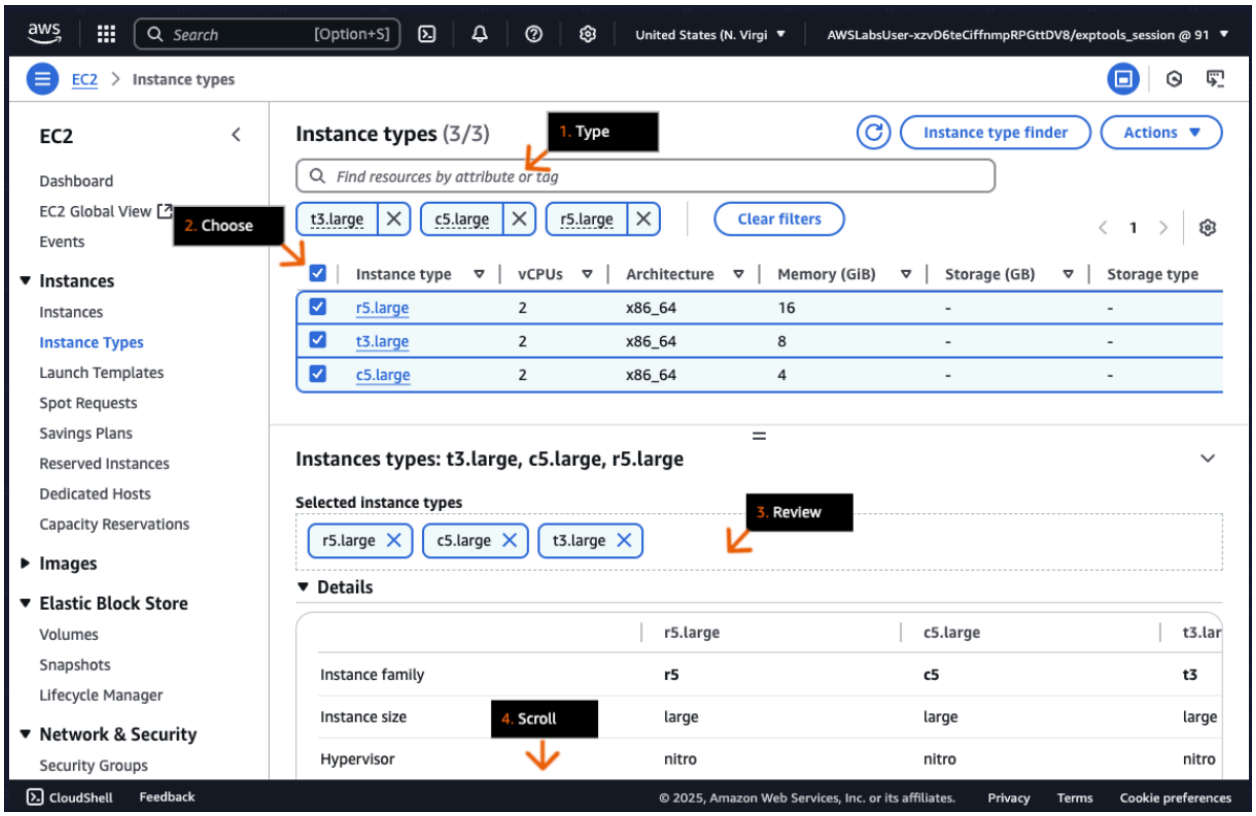
EC2 instance families are optimized for different computing needs.

1. In the left navigation pane, click Instance Types.
2. Go to the next step.



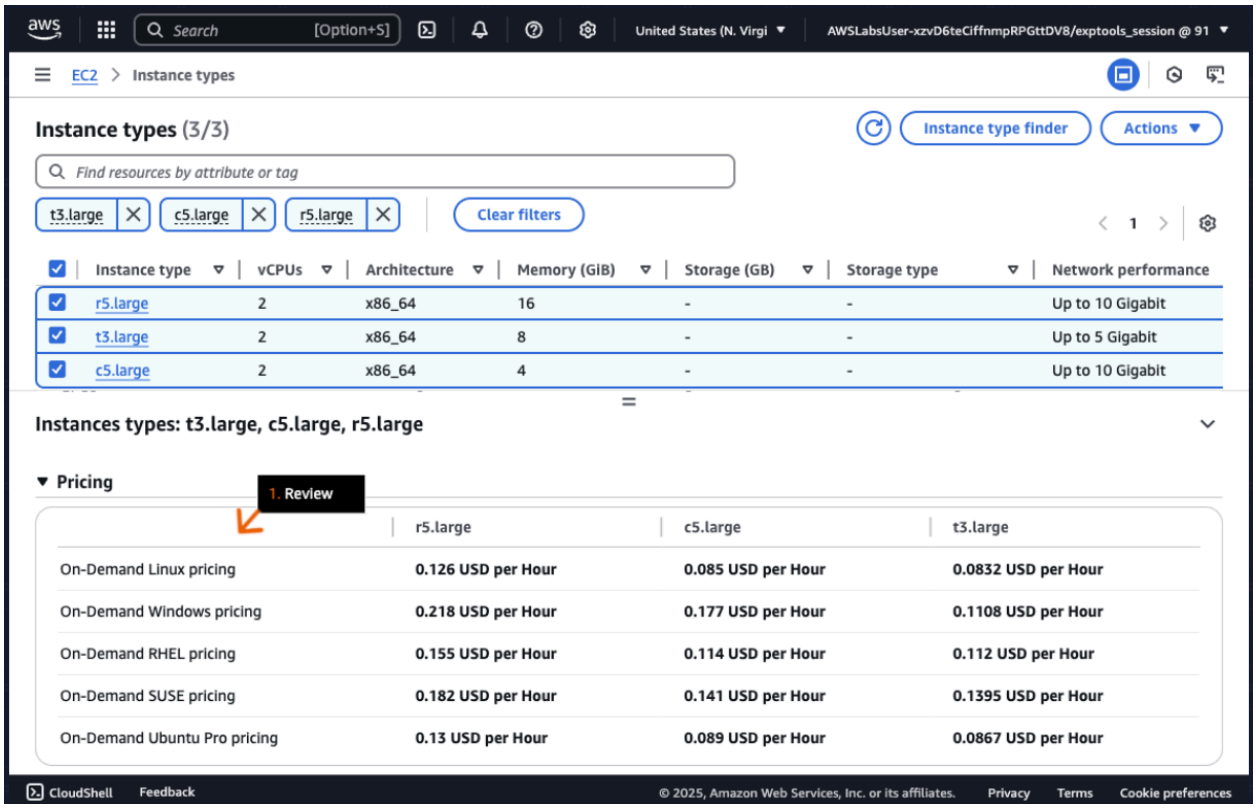
Instance types offer multiple sizes to scale resources to workload requirements.

1. In the Instance types search box, type the following three types and press Enter after each:
t3.large
c5.large
r5.large
2. Choose the top checkbox to select the three instance types.
3. Below that, review the details of the selected types.
4. Scroll down and review the Compute, Networking, and Storage details (not shown).
5. Go to the next step.



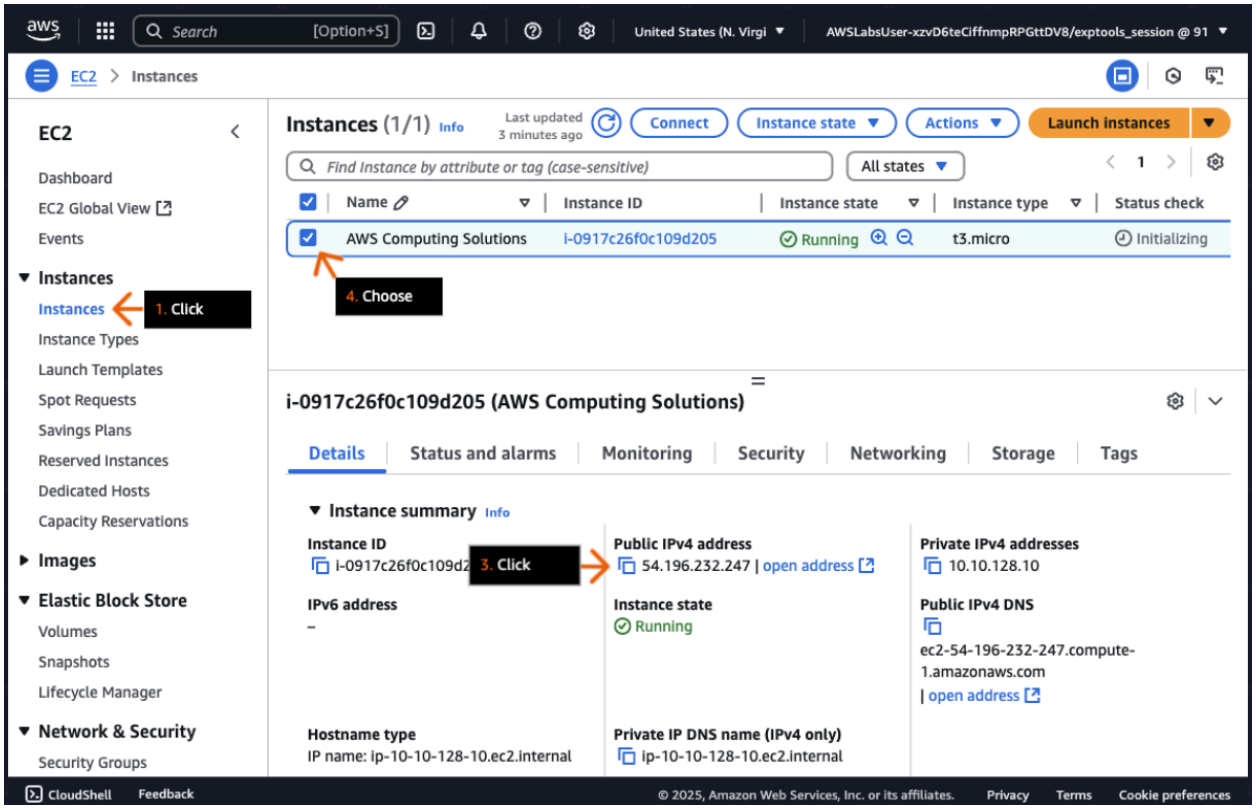
Prices vary by resource specifications (vCPUs, memory, network) and operating system licensing.

1. Scroll down and review the Pricing details.
2. Go to the next step.

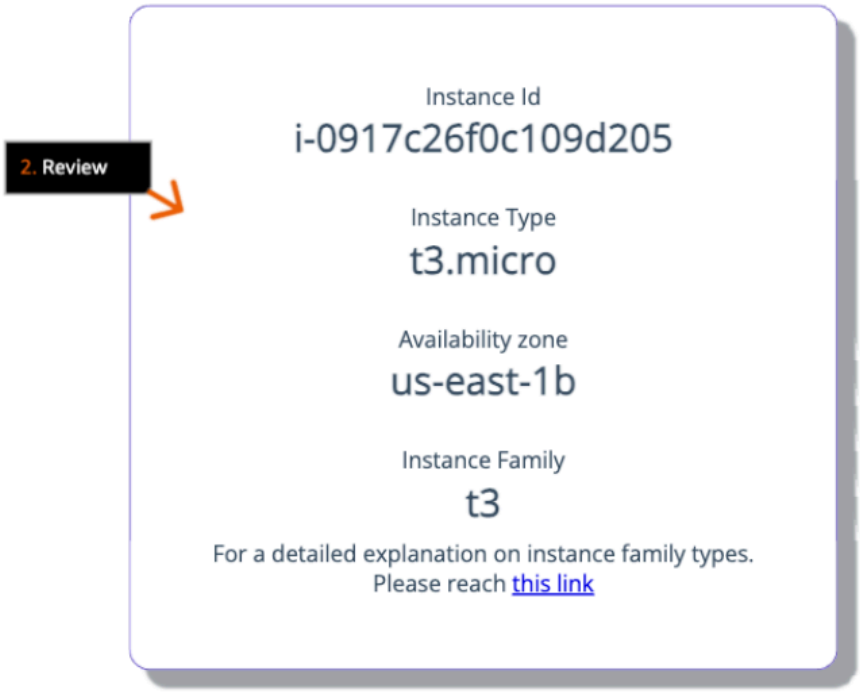


Instance metadata provides running instance information, including host name, events, and security groups.

1. In the left navigation bar, click Instances.
2. In the Instances section, choose the checkbox to select the AWS Computing Solutions instance.
3. On the Details tab, under Public IPv4 address, click the copy icon to copy the provided address.
- Do not click the "open address" link.
4. Go to the next step.

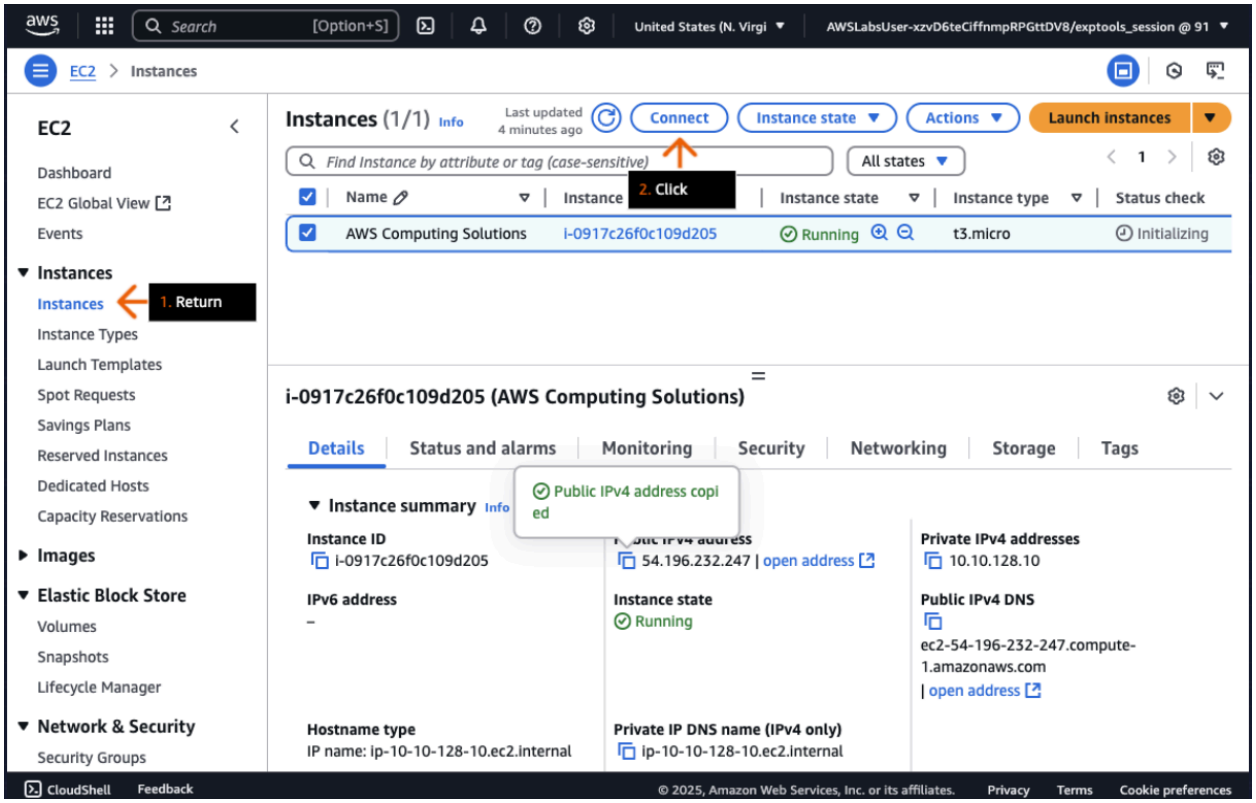


You can enable IMDS in Advanced details to access instance attributes through a public IP.
1. In a new browser tab (or window) address bar, paste the IP address that you just copied and press Enter (not shown).
- Make sure to use http:// rather than https://.
2. Review the instance details.
3. Go to the next step.



You can connect to EC2 instances by using EC2 Instance Connect, Session Manager (a capability of AWS Systems Manager), or SSH clients.

1. In the other browser tab, return to the Instances page on the Amazon EC2 console.
2. In the Instances section, click Connect.
3. Go to the next step.

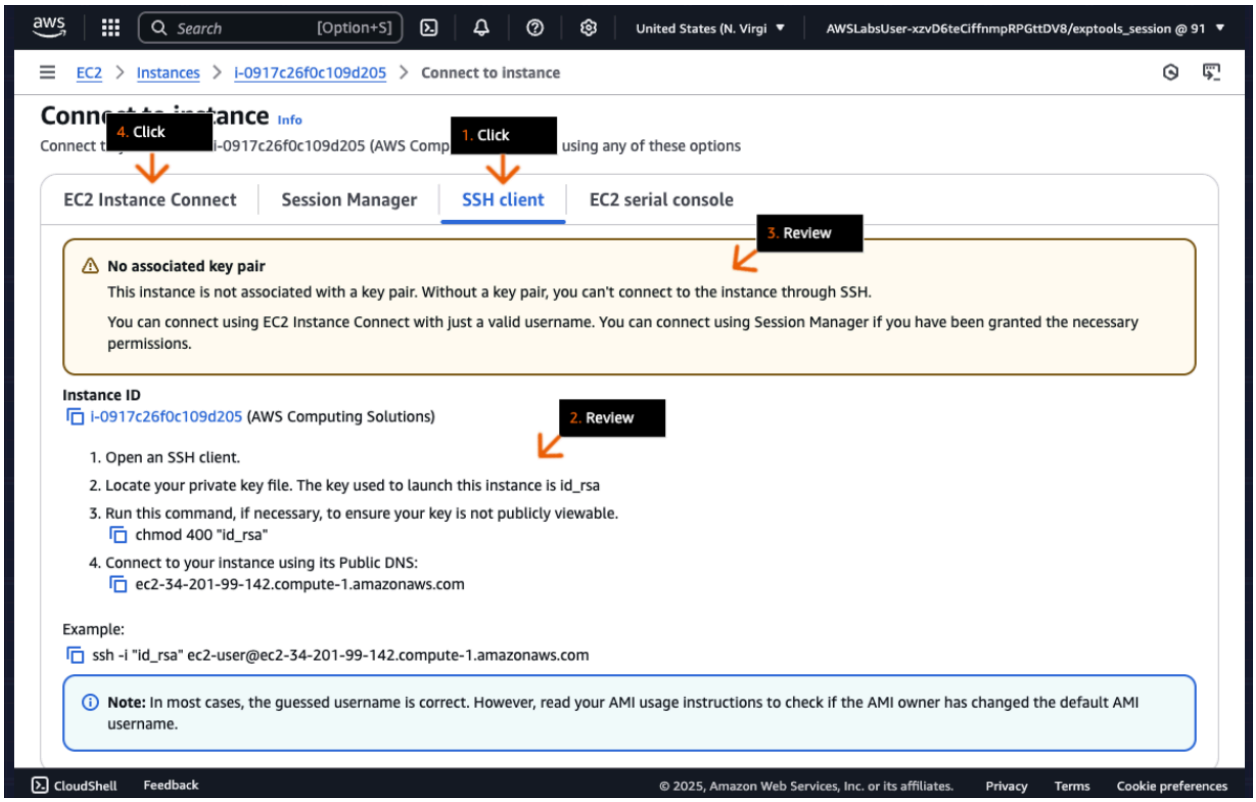


SSH client connections require an instance key pair and might need client installation on your device.

1. Click the SSH client tab.
2. Review the requirements to connect through SSH.
3. In the warning alert, review the key pair message.

- Because no SSH key pair was created for this instance, connecting through SSH is not possible.

4. Click the EC2 Instance Connect tab.
5. Go to the next step.

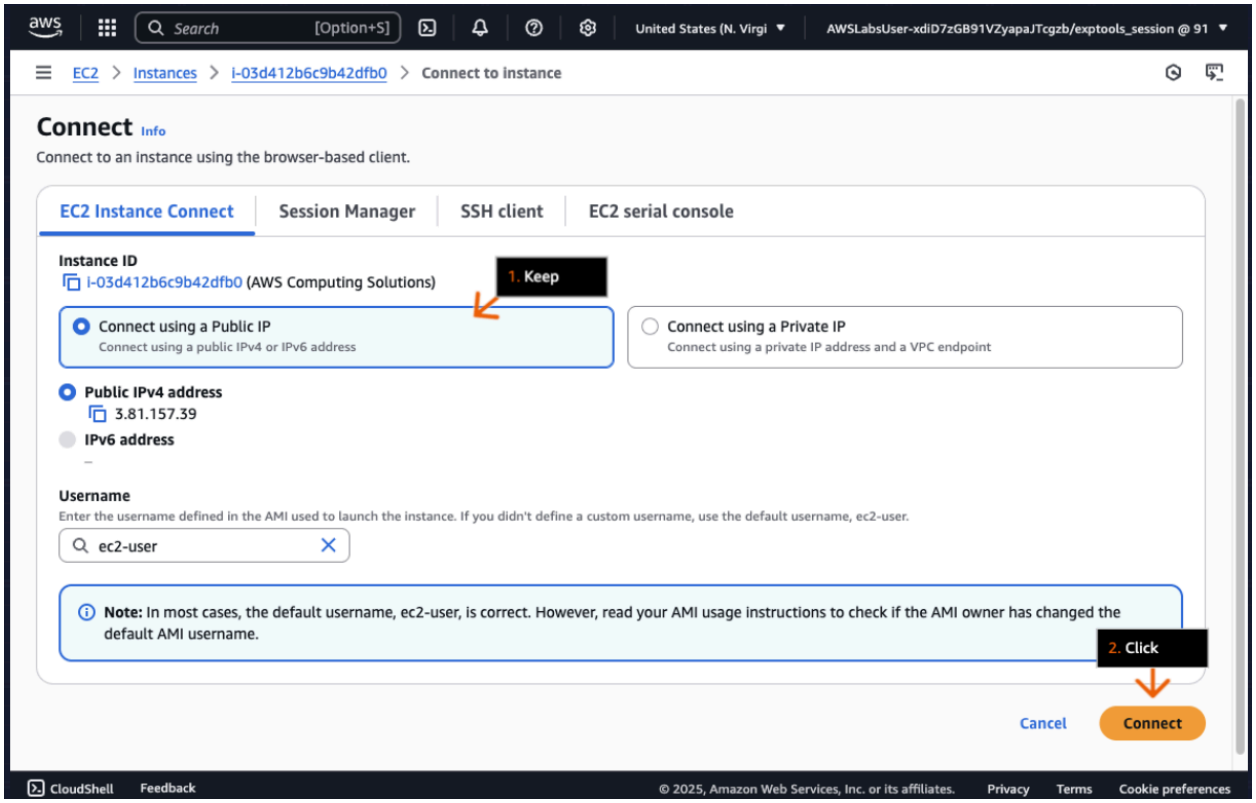


EC2 Instance Connect enables secure Linux instance access using AWS Identity and Access Management (IAM) policies, removing the need for SSH key management.

1. For Instance ID, keep the default choice of Connect using a Public IP.
2. Click Connect.

- EC2 Instance Connect, containing the command-line shell, opens in a new browser tab (or window).

3. Go to the next step.



Connected instances support both Linux commands and AWS Command Line Interface (AWS CLI) commands, which manages AWS resources through text-based commands instead of the graphical console.

1. To change to the application directory, in the terminal window, at the command prompt, run (type the command and press Enter):

cd sample_app

- You can also copy-paste this text. If you receive an undefined value when you paste this, try again.
- A sample application resides on this instance.

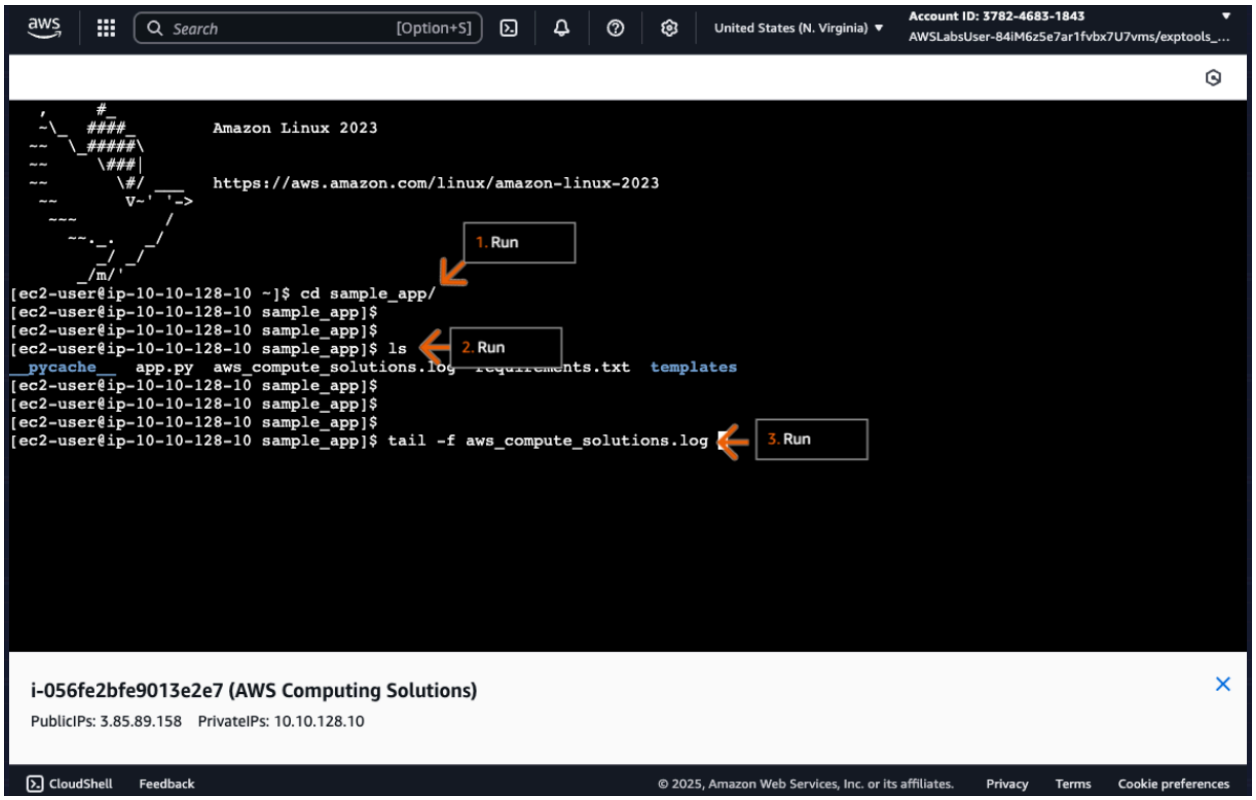
2. To view the files in the sample_app directory, run:

ls

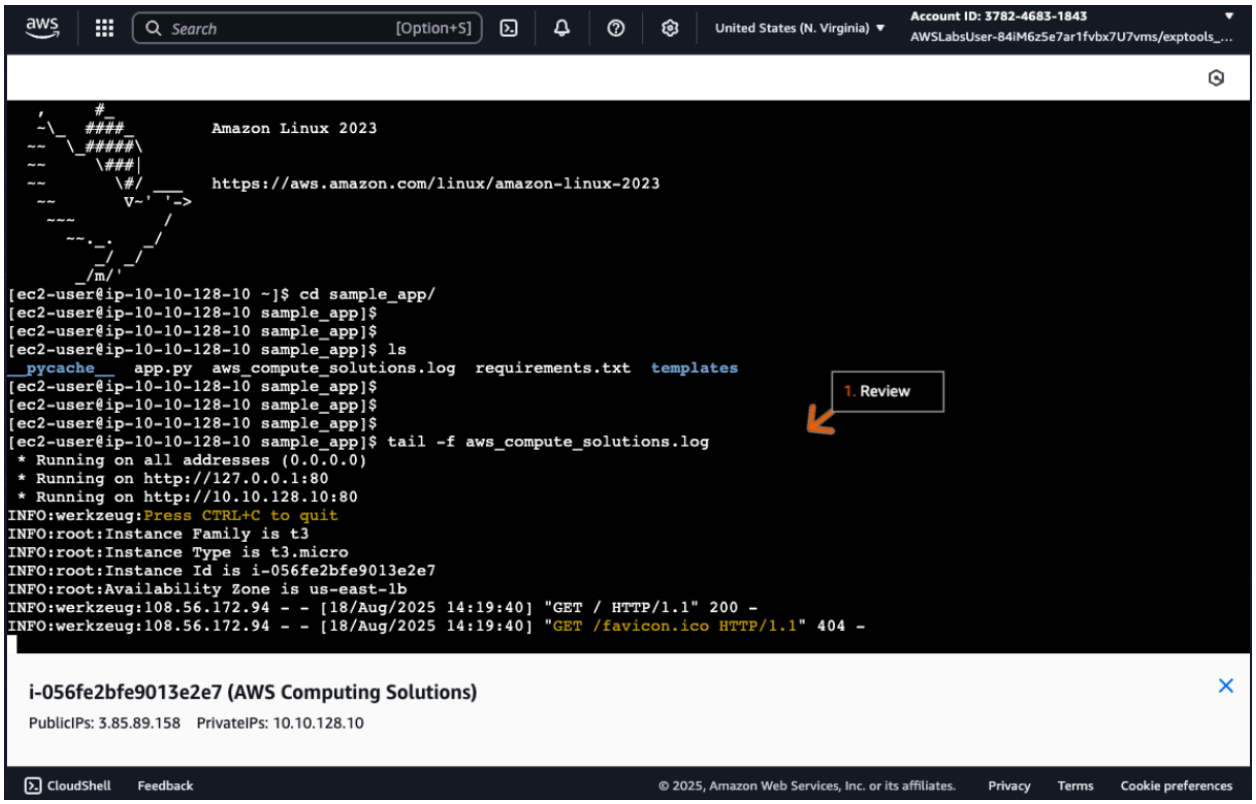
3. To check the instance log, run:

tail -f aws_compute_solutions.log

4. Go to the next step.

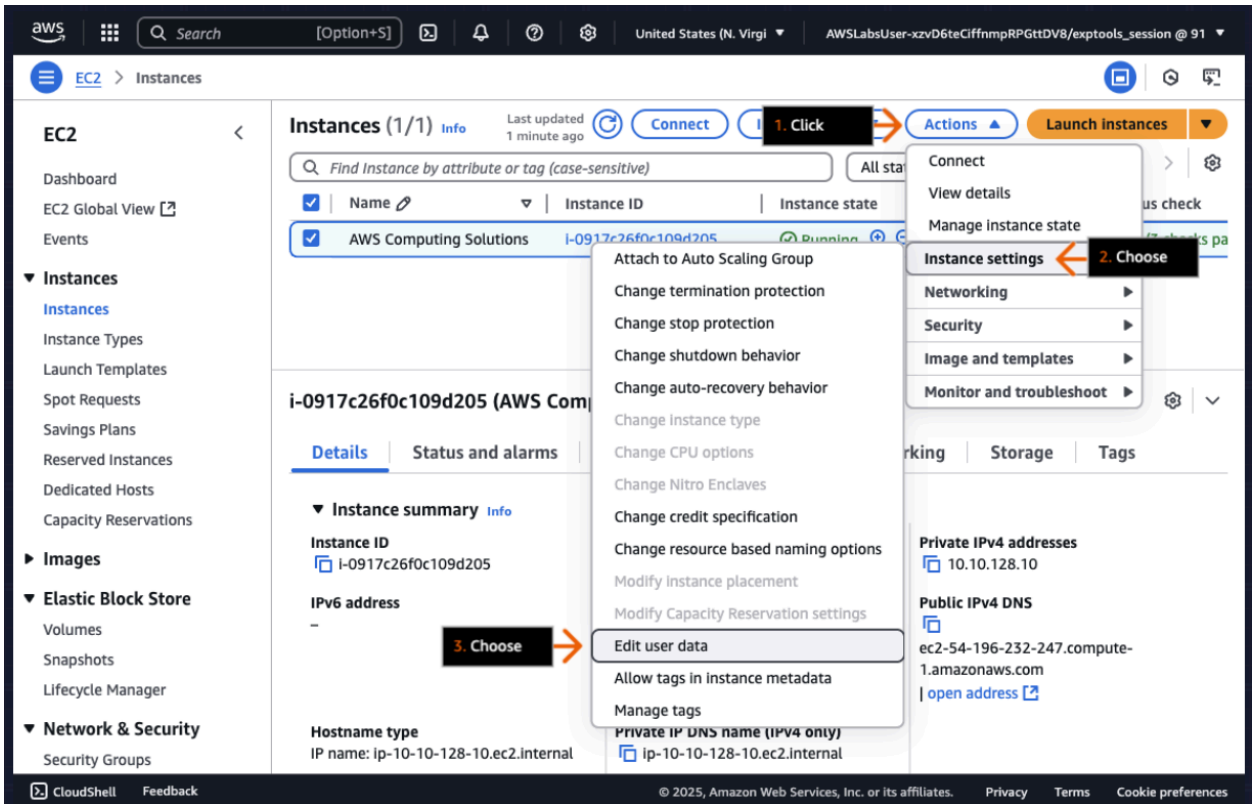


1. Review the log details.
- To quit, press Ctrl+C on your keyboard.
2. To return to the Instances page on the Amazon EC2 console, close the current browser tab (not shown).
3. Go to the next step.



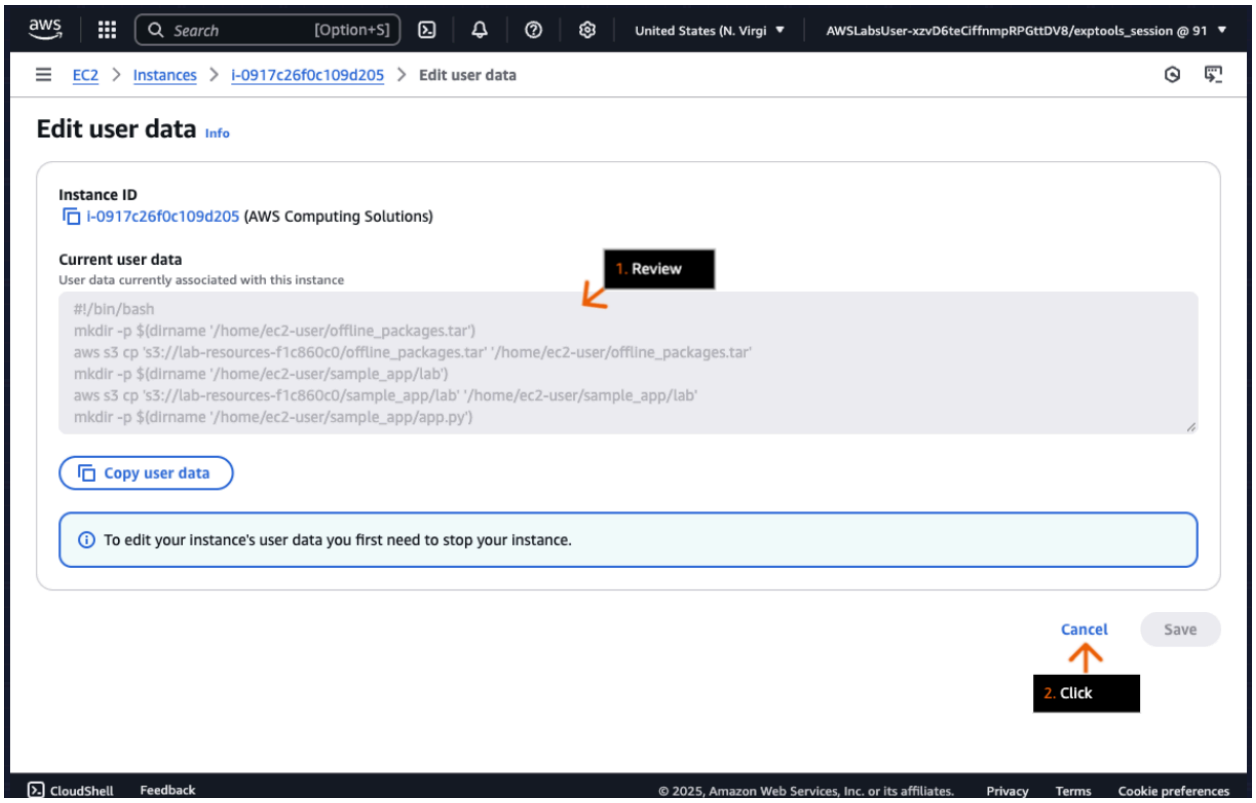
The Actions menu controls instance states and attributes.

1. Click Actions to expand the dropdown list.
2. Choose Instance settings.
3. Choose Edit user data.
4. Go to the next step.



Instance metadata provides access to user data specified during launch.

1. For Current user data, review the commands.
2. Click Cancel.
3. Go to the next step.

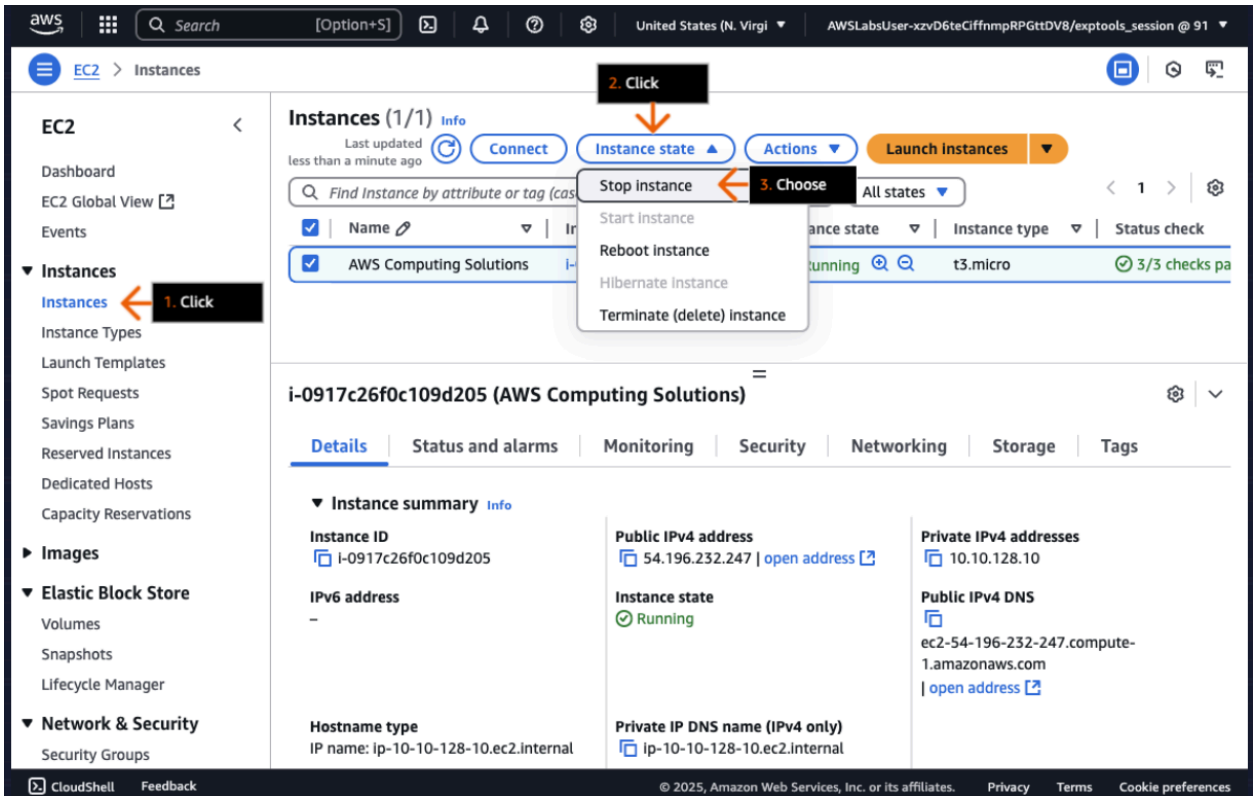


The Instance state menu controls instance activity, including start and stop actions for EBS-backed instances.

1. In the left navigation pane, click Instances.
2. In the Instances section, click Instance state to expand the dropdown list.
3. Choose Stop instance.

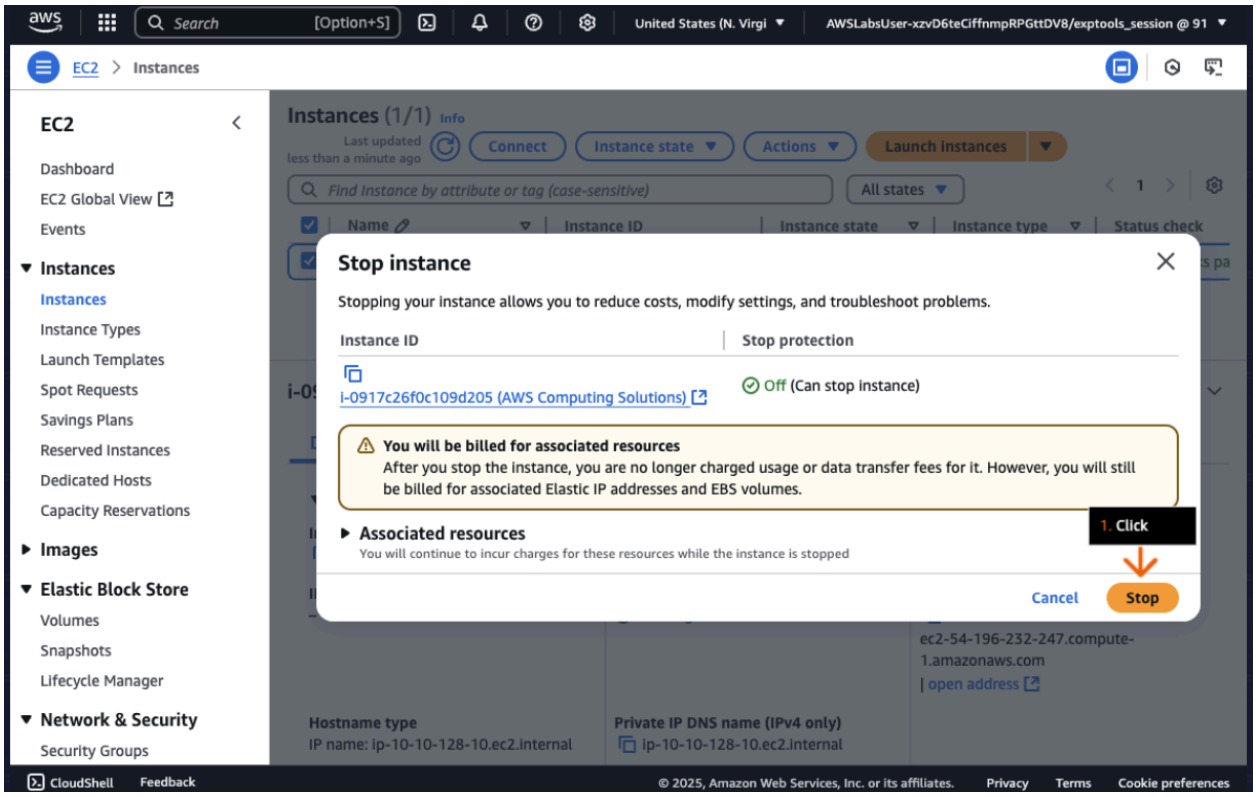
- If the Stop instance option is not available, make sure the AWS Computing Solutions instance is selected.

4. Go to the next step.

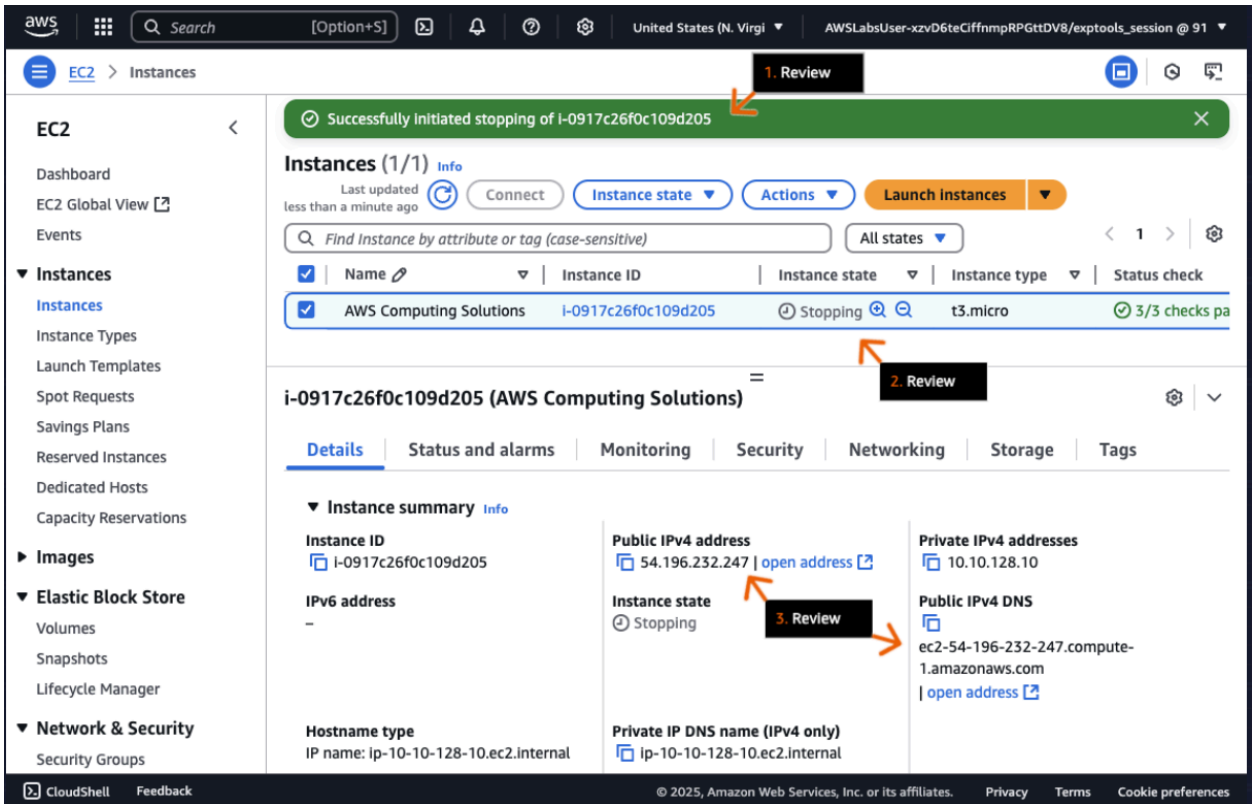


Stopped instances incur charges only for attached EBS volumes.

1. In the pop-up box, click Stop.
2. Go to the next step.



Starting instances incurs a one-minute minimum charge, then per-second billing applies.
1. In the success alert, review the message.
2. Under Instance state, review to confirm that the instance is stopped.
- Wait until Stopped is displayed before you proceed.
3. For the stopped instance, on the Details tab, review to confirm that the Public IPv4 address and Public IPv4 DNS are now empty.
- You might need to wait 1–2 minutes and click the Instances section refresh icon.
4. Go to the next step.

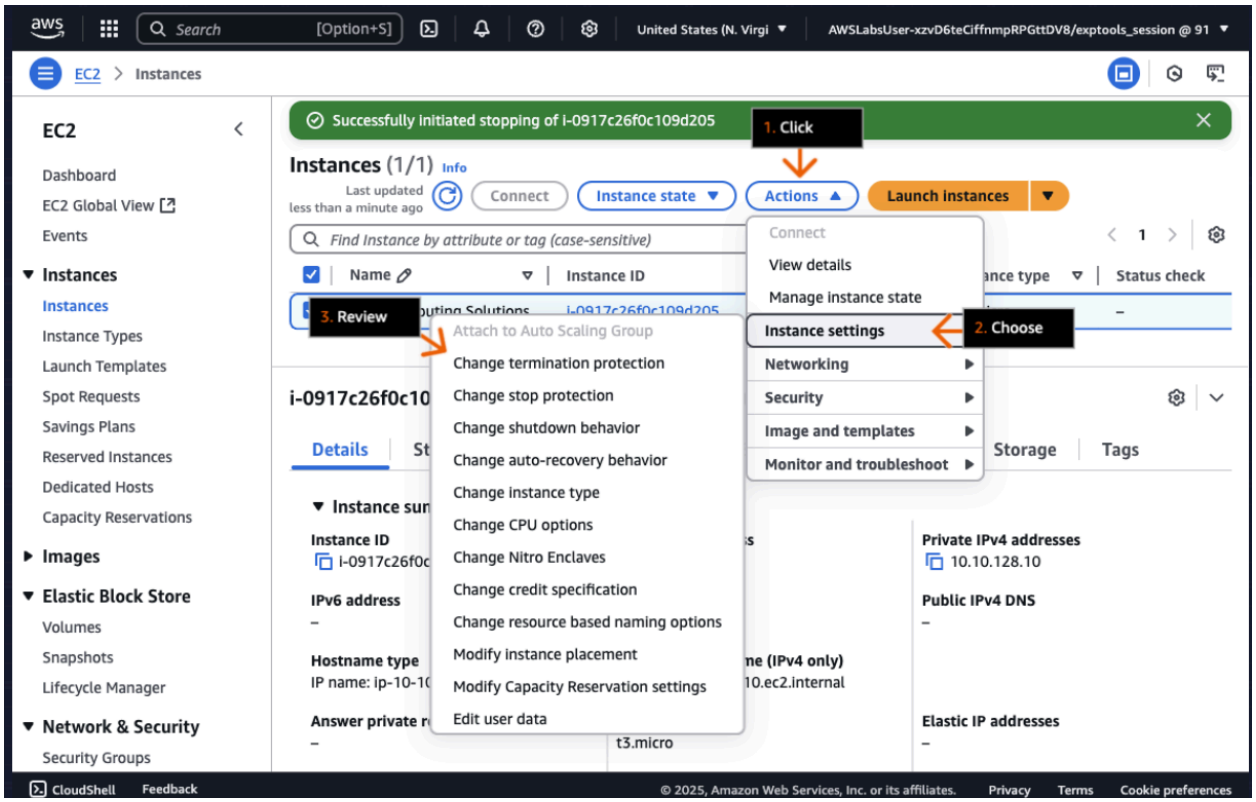


Instance type changes require stopping EBS-backed instances, with restart time varying based on application scripts.

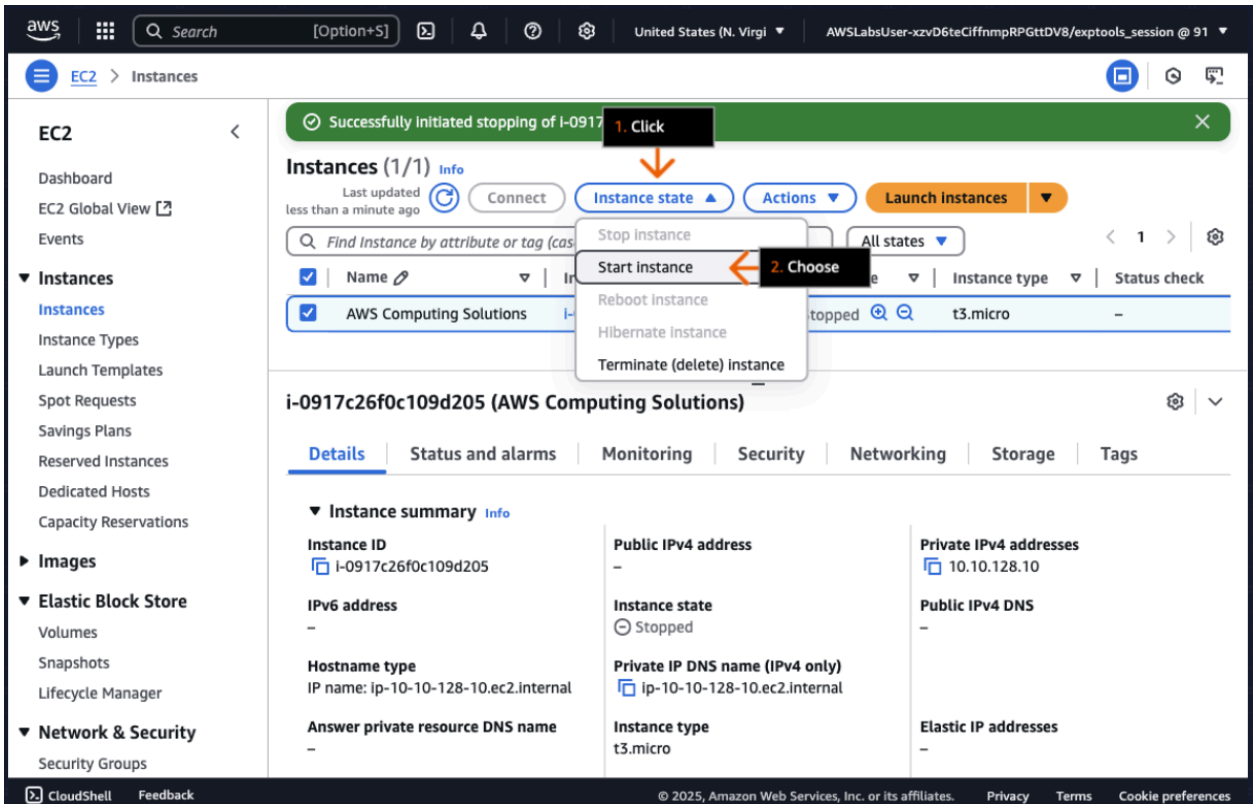
1. Click Actions to expand the dropdown list.
2. Choose Instance settings.
3. Review the available options.

- You can change your instance with different options, such as type, termination protection, and shutdown behavior.

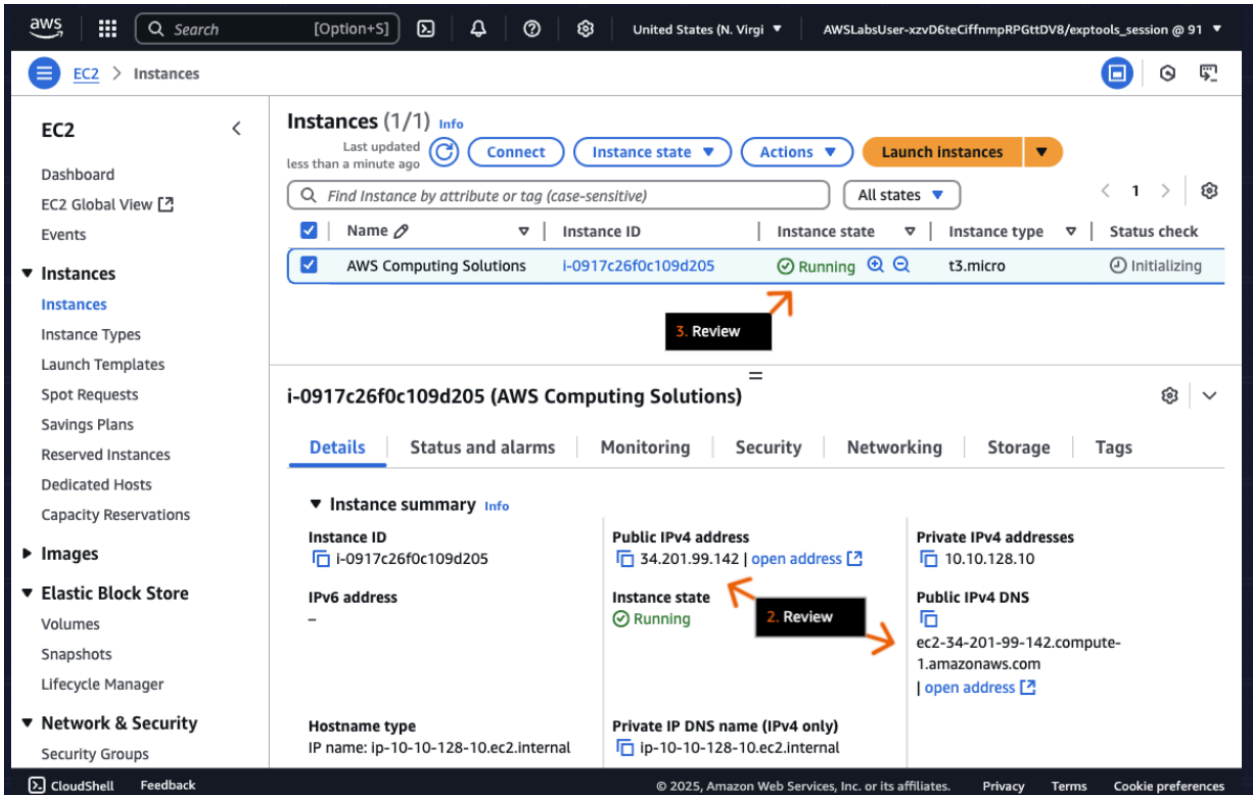
4. Go to the next step.



1. Click Instance state to expand the dropdown list.
2. Choose Start instance.
3. Go to the next step.



1. Under Instance state, review to confirm that the instance is running.
- Wait until Running is displayed before you proceed.
2. For the running instance, on the Details tab, review to confirm that the Public IPv4 address and Public IPv4 DNS are now populated.
3. Go to the next step.



DIY Activity: