Swinburne University of Technology

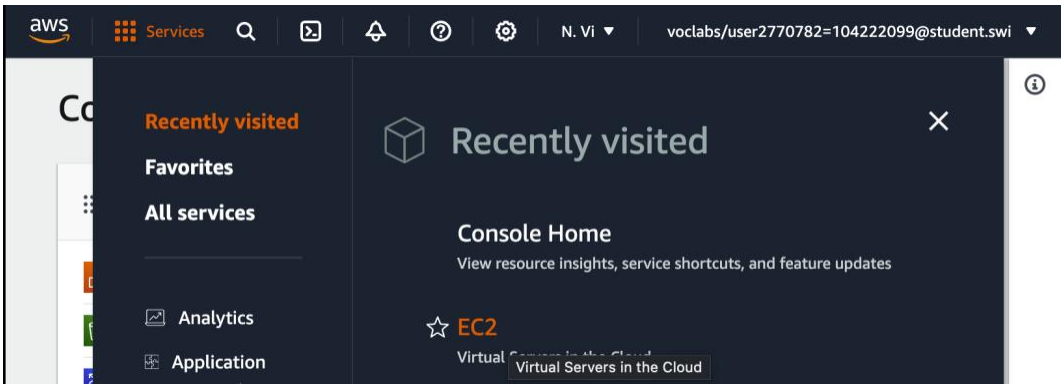
COS20019 Cloud Computing Architecture

Lab 6 - Scale & Load Balance your Architecture

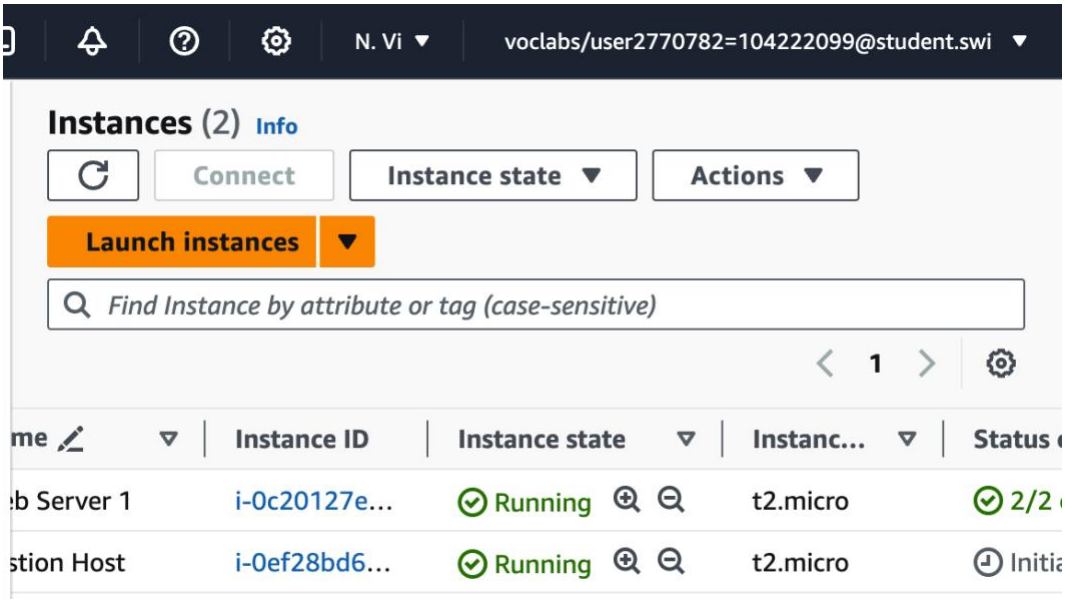
Saturday 21th October, 2023

Task 1: Create an AMI for Auto Scaling

In the **AWS Management Console**, in the search box next to **Services** , search for and select **EC2**.

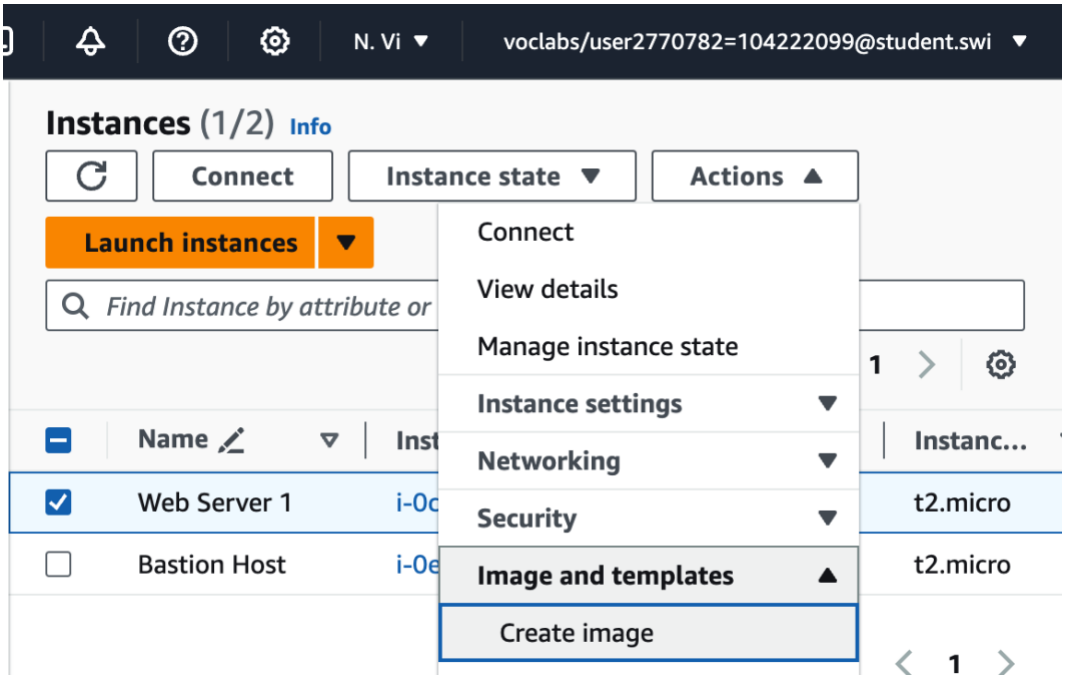


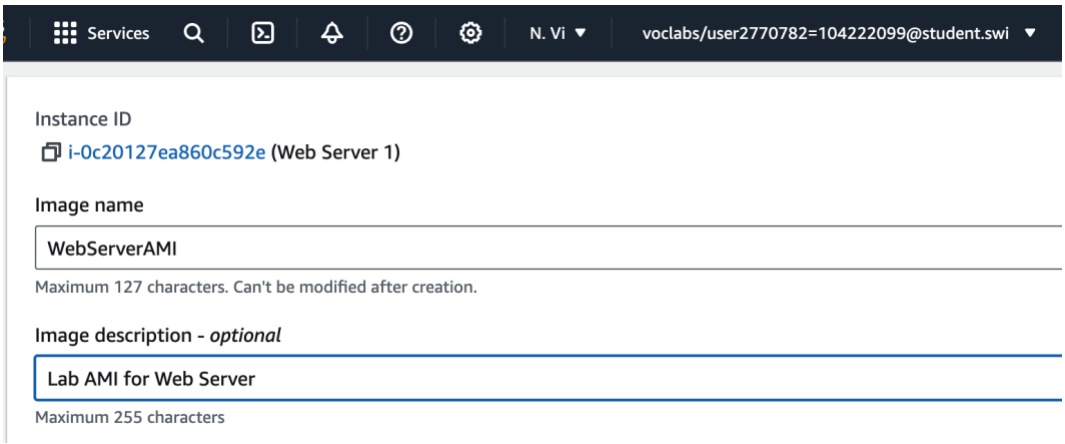
In the left navigation pane, choose **Instances**.
First, you will confirm that the instance is running.
Wait until the **Status Checks** for **Web Server 1** display ***2/2 checks passed***.



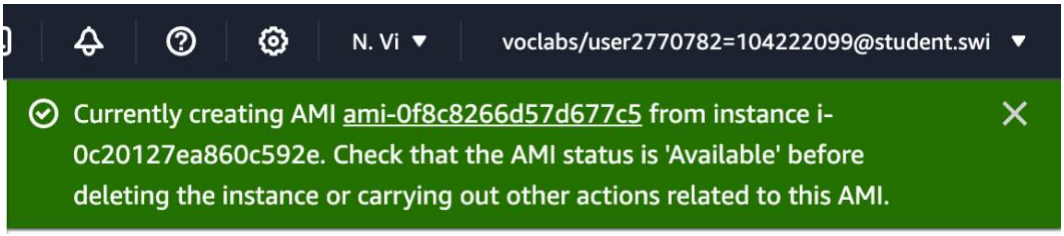
Select **Web Server 1**.
In the **Actions** menu, choose **Image and templates** > **Create image**, then configure:

- **Image name:** WebServerAMI
- **Image description:** Lab AMI for Web Server





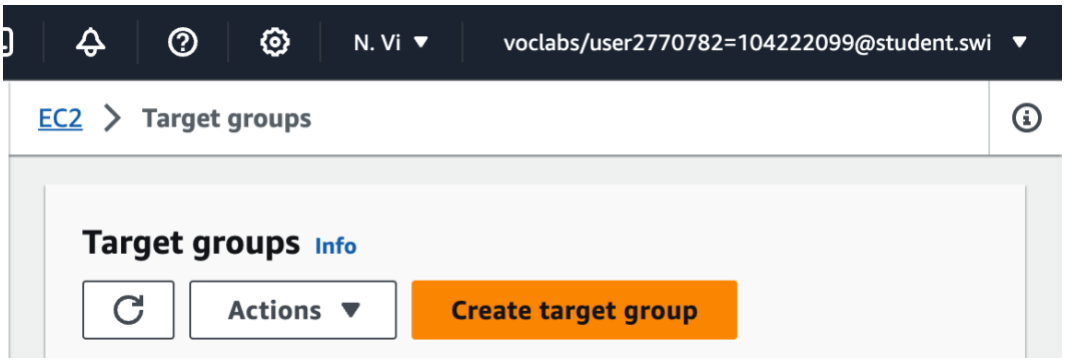
Choose **Create image**
A confirmation banner displays the **AMI ID** for your new AMI.

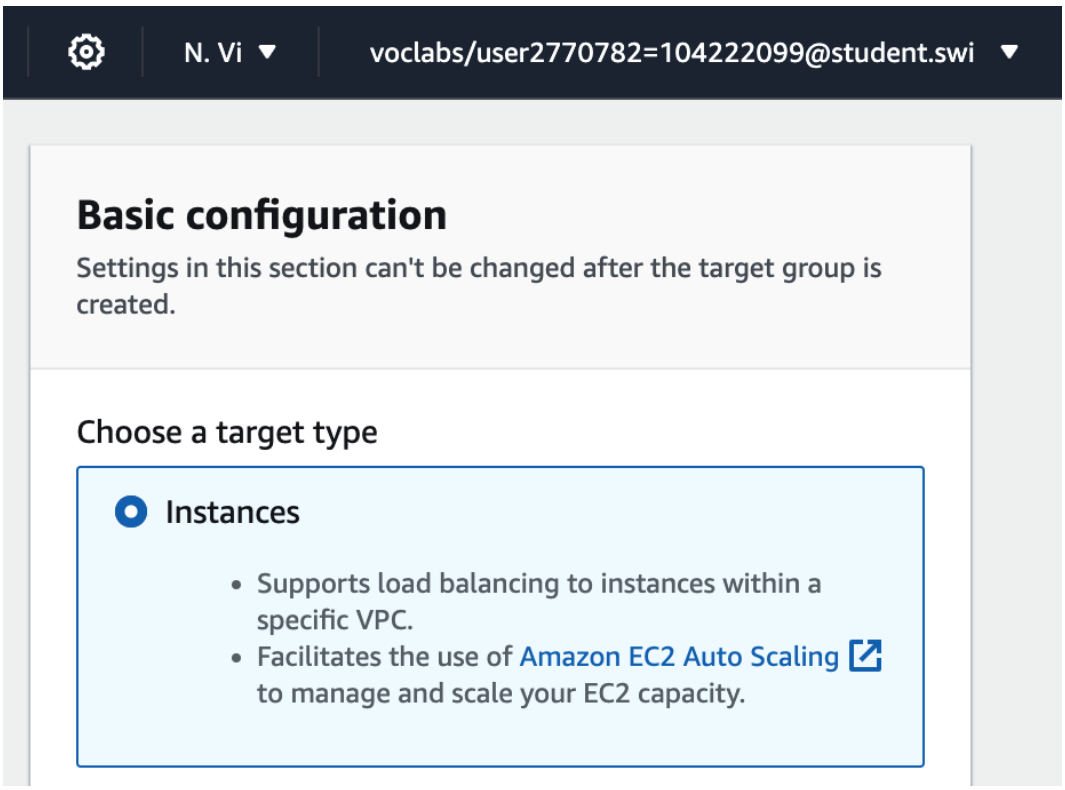


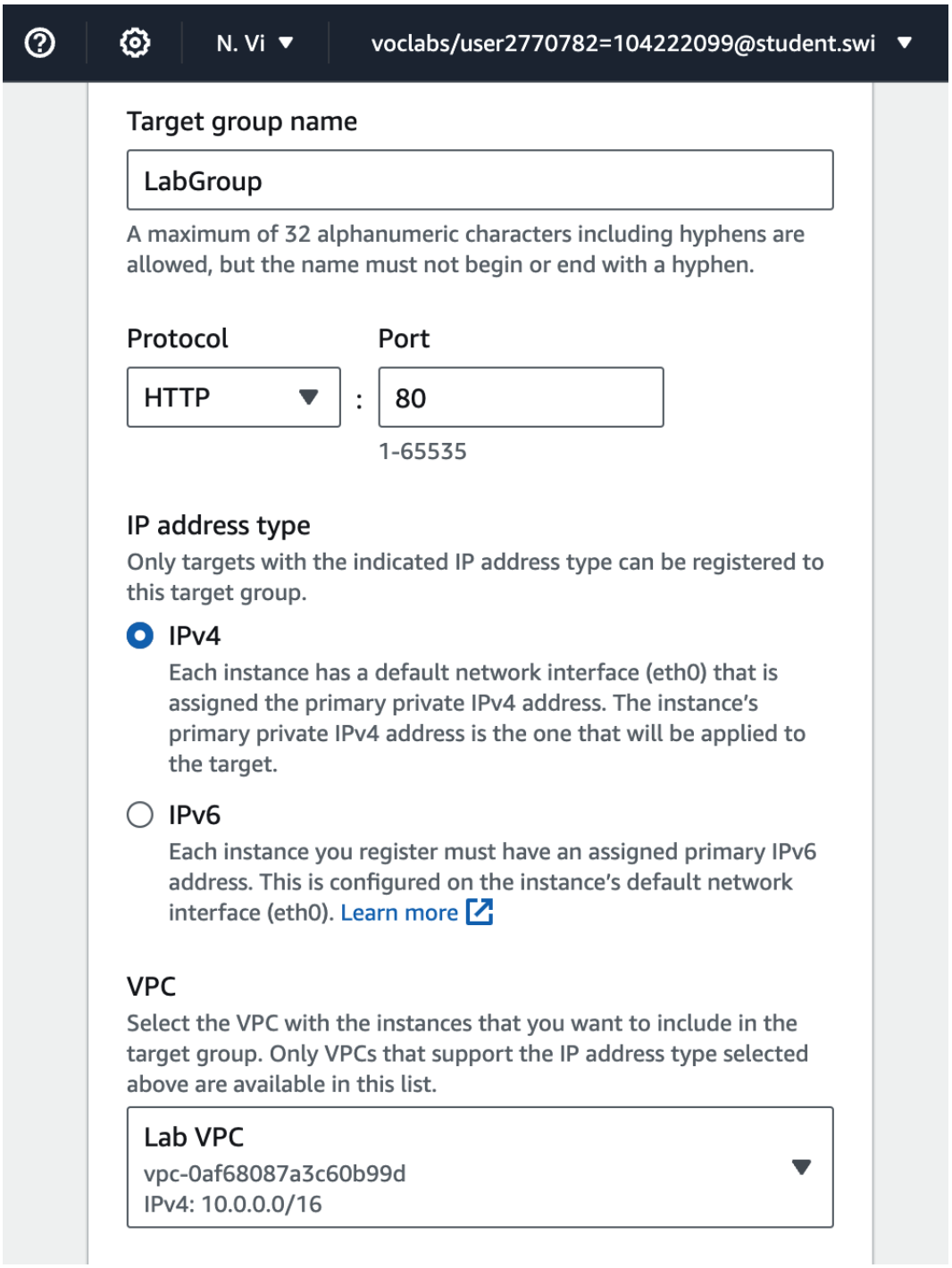
Task 2: Create a Load Balancer

In the left navigation pane, choose **Target Groups**.

- Choose **Create target group**
- Choose a target type: **Instances**
- **Target group name**, enter: LabGroup
- Select **Lab VPC** from the **VPC** drop-down menu.

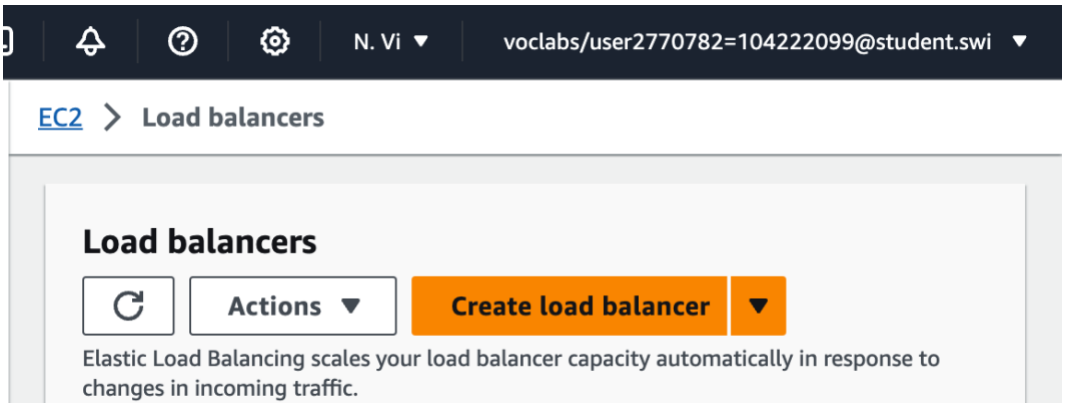




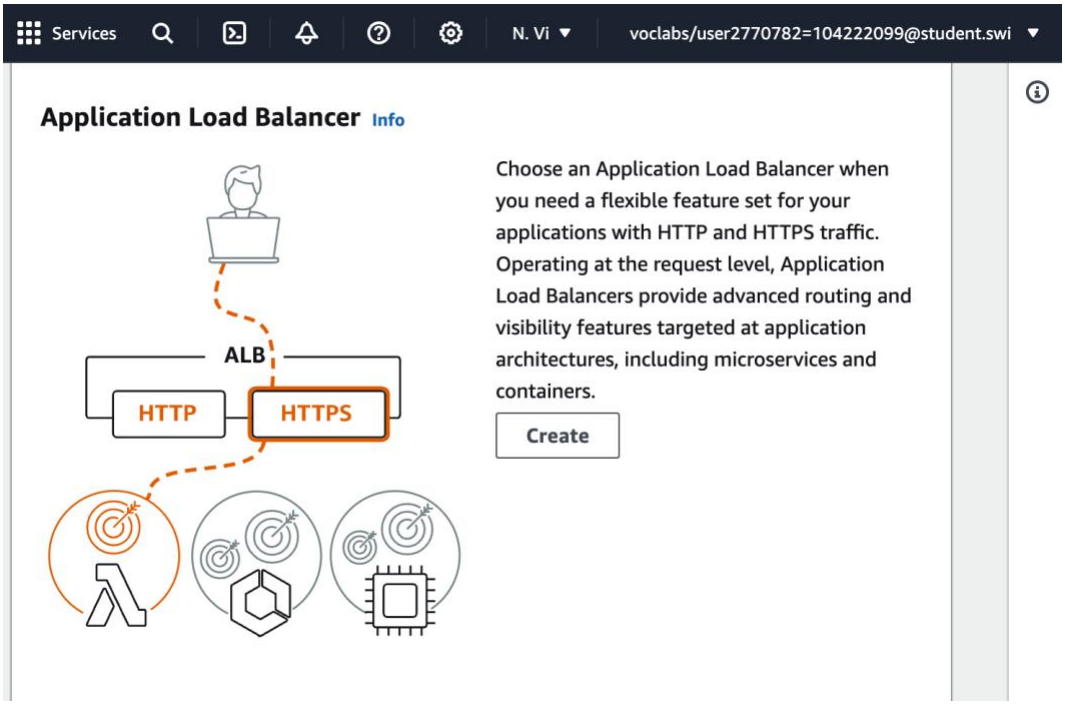


Choose **Next**. The **Register targets** screen appears.
Review the settings and choose **Create target group**

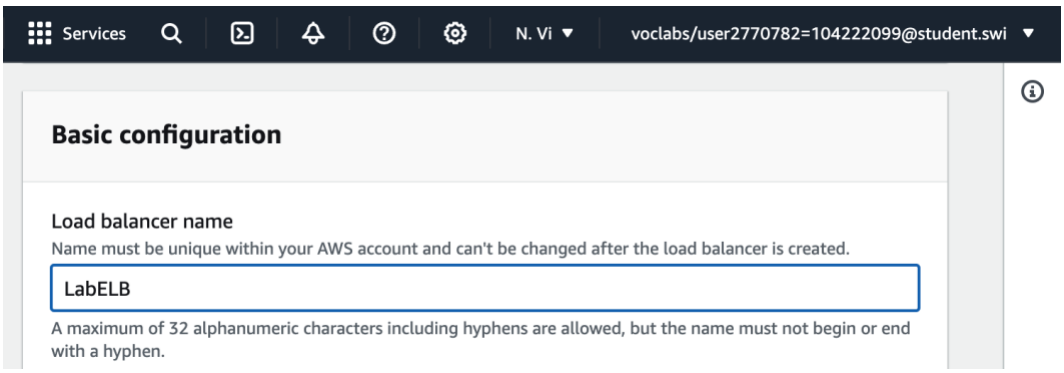
In the left navigation pane, choose **Load Balancers**.
At the top of the screen, choose **Create load balancer**.



Under **Application Load Balancer**, choose **Create**



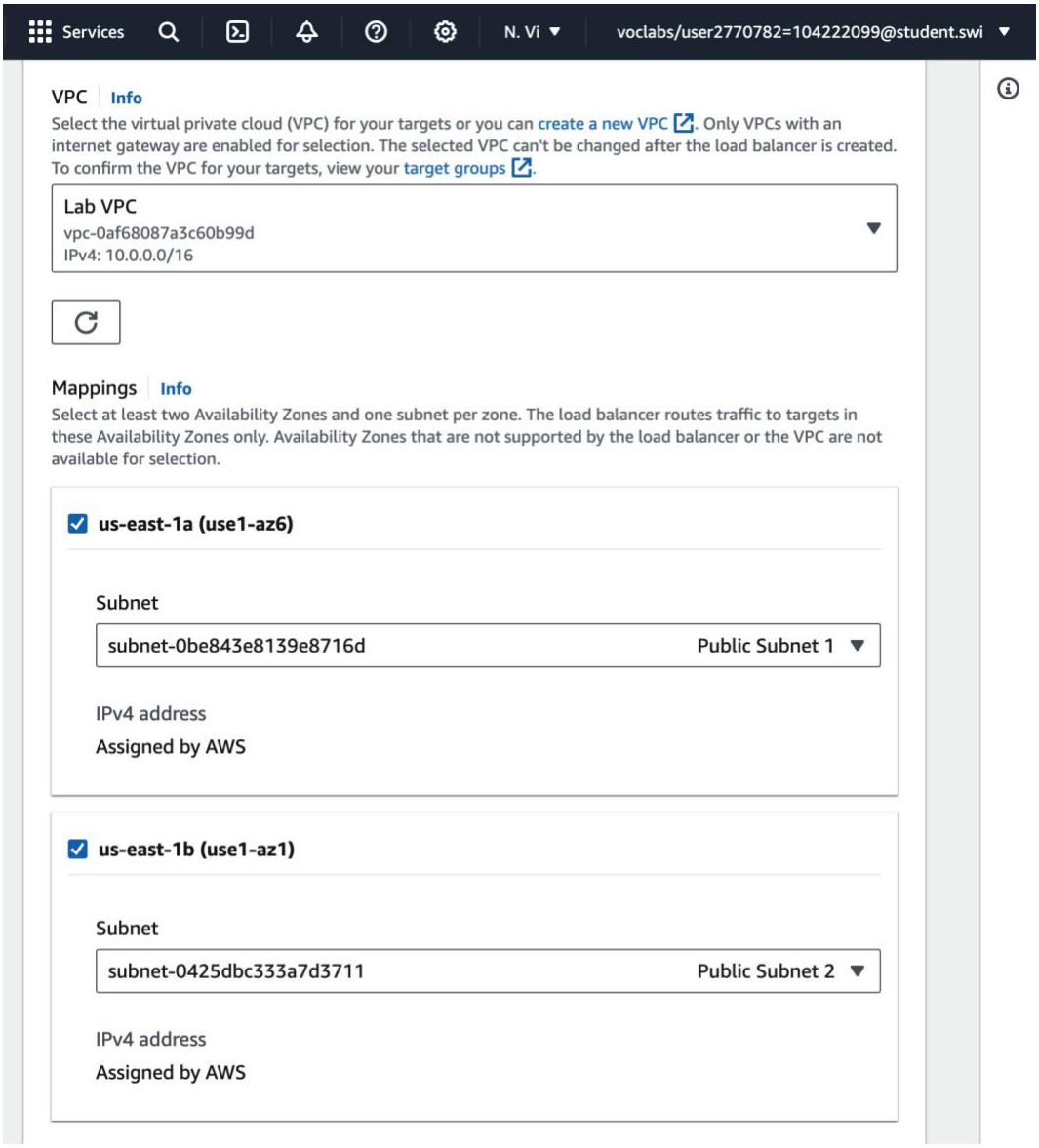
Under **Load balancer name**, enter: LabELB



Scroll down to the **Network mapping** section, then:

- For **VPC**, choose **Lab VPC**
- Choose the **first** displayed Availability Zone, then select **Public Subnet 1** from the Subnet drop down menu that displays beneath it.
- Choose the **second** displayed Availability Zone, then select **Public Subnet 2** from the Subnet drop down menu that displays beneath it.

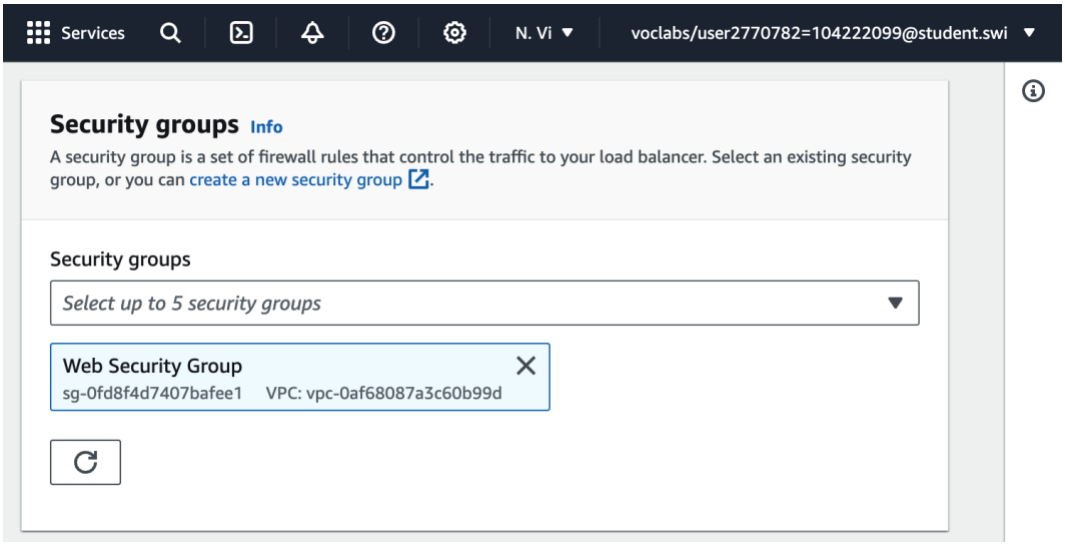
You should now have two subnets selected: **Public Subnet 1** and **Public Subnet 2**.



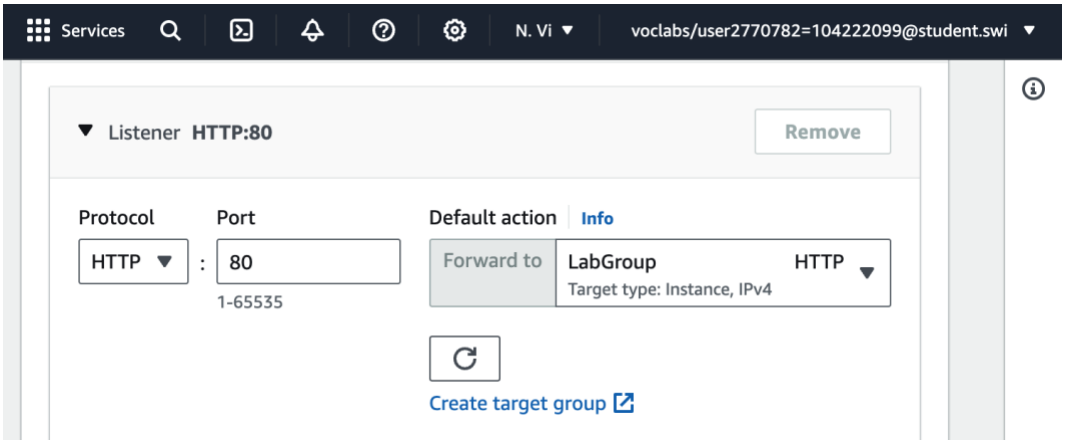
In the **Security groups** section:

- Choose the Security groups drop down menu and select **Web Security Group**
- Below the drop down menu, choose the **X** next to the default security group to remove it.

The **Web Security Group** security group should now be the only one that appears.

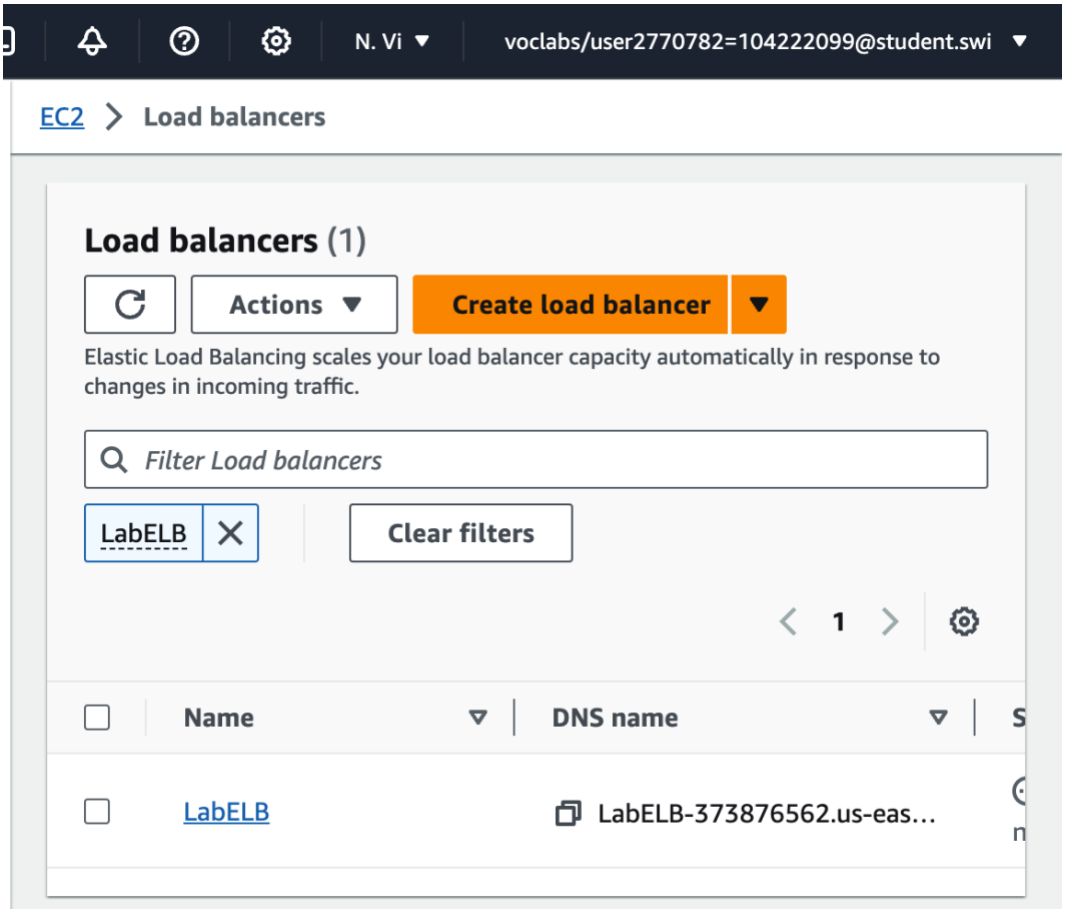


For the Listener HTTP:80 row, set the Default action to forward to **LabGroup**.



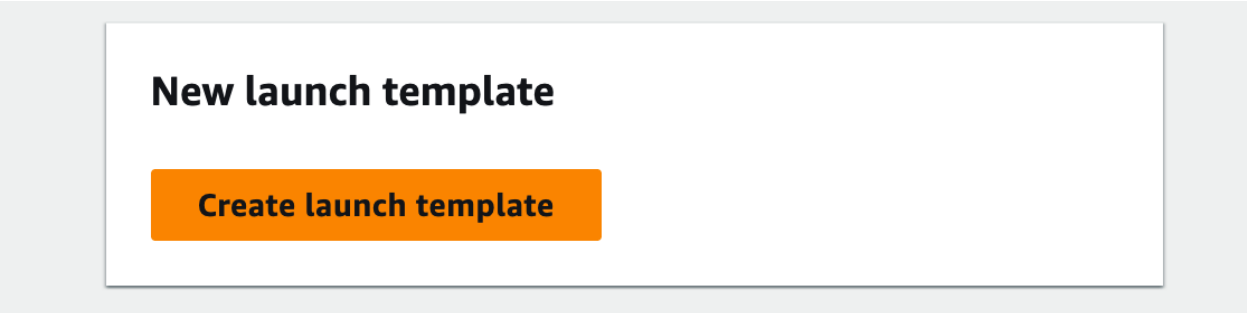
Scroll to the bottom and choose **Create load balancer**
The load balancer is successfully created.

- Choose **View load balancer**



Task 3: Create a Launch Template and an Auto Scaling Group

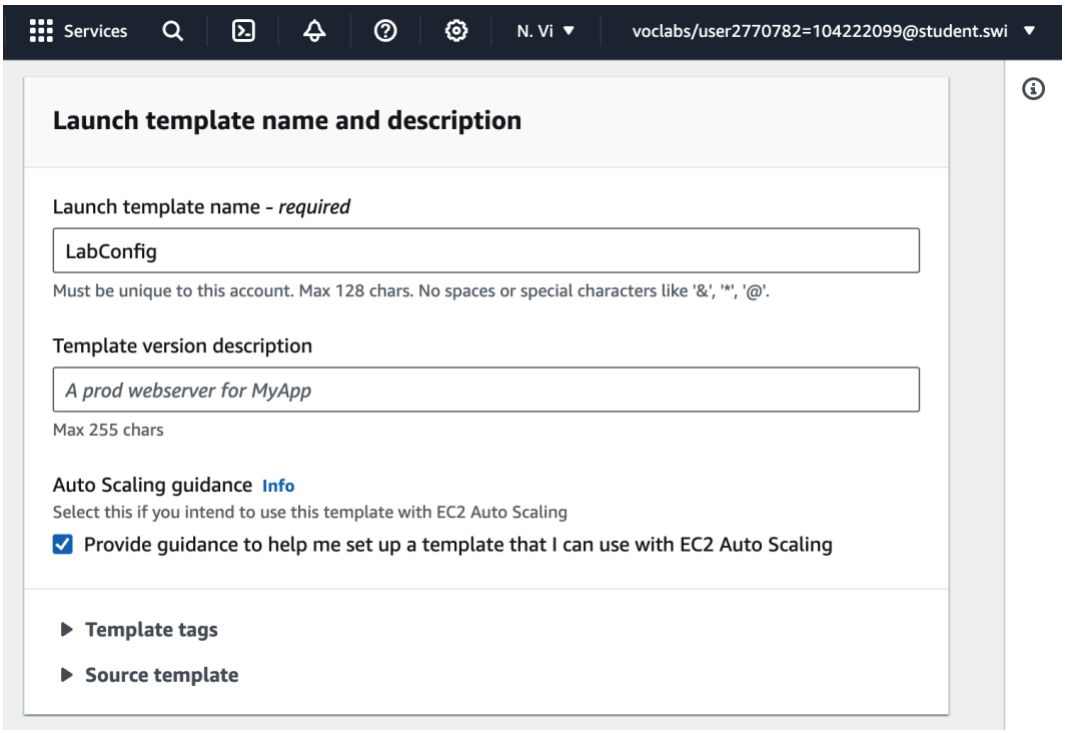
In the left navigation pane, choose **Launch Templates**.
Choose **Create launch template**



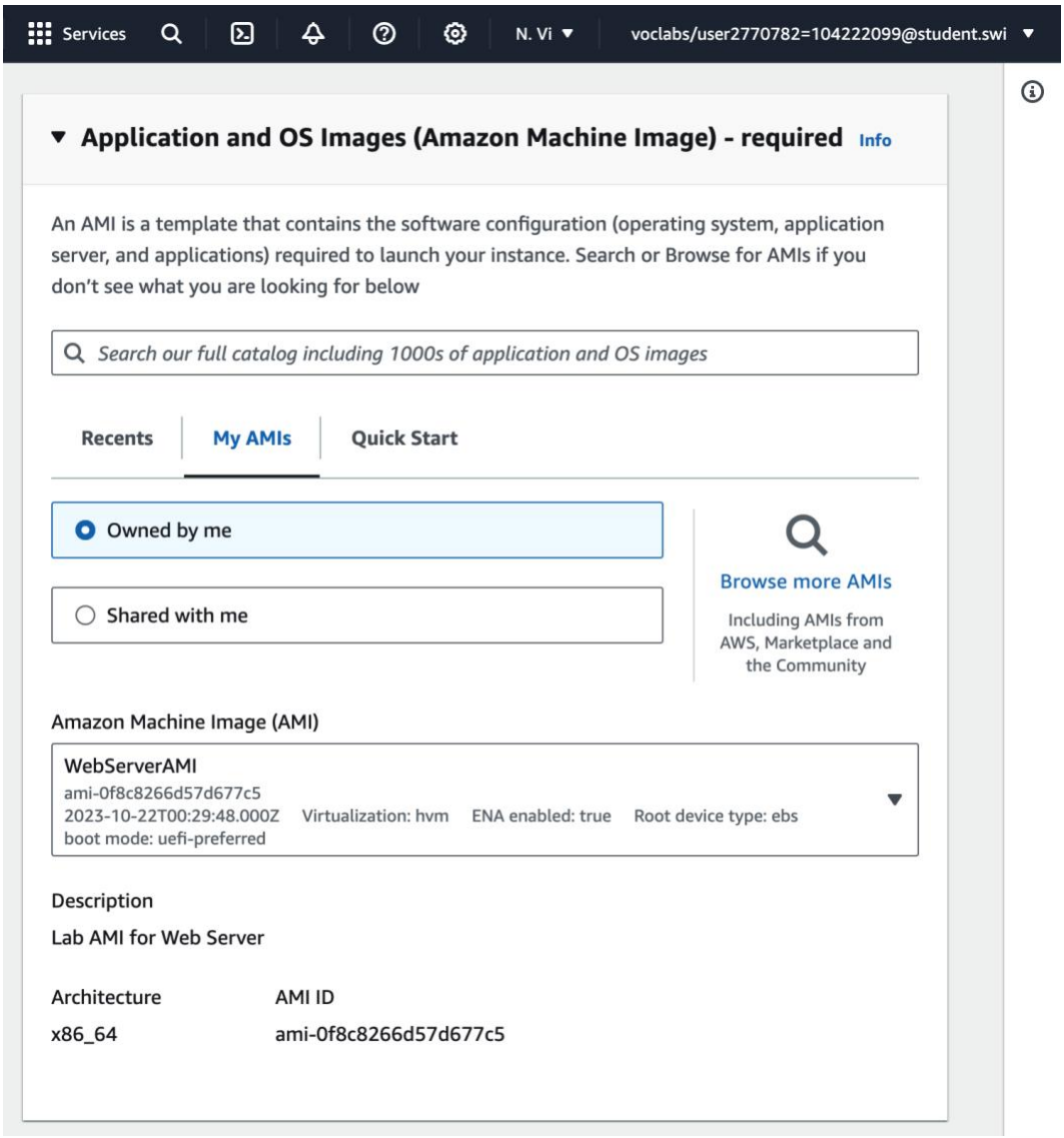
Configure the launch template settings and create it:

- **Launch template name:** LabConfig

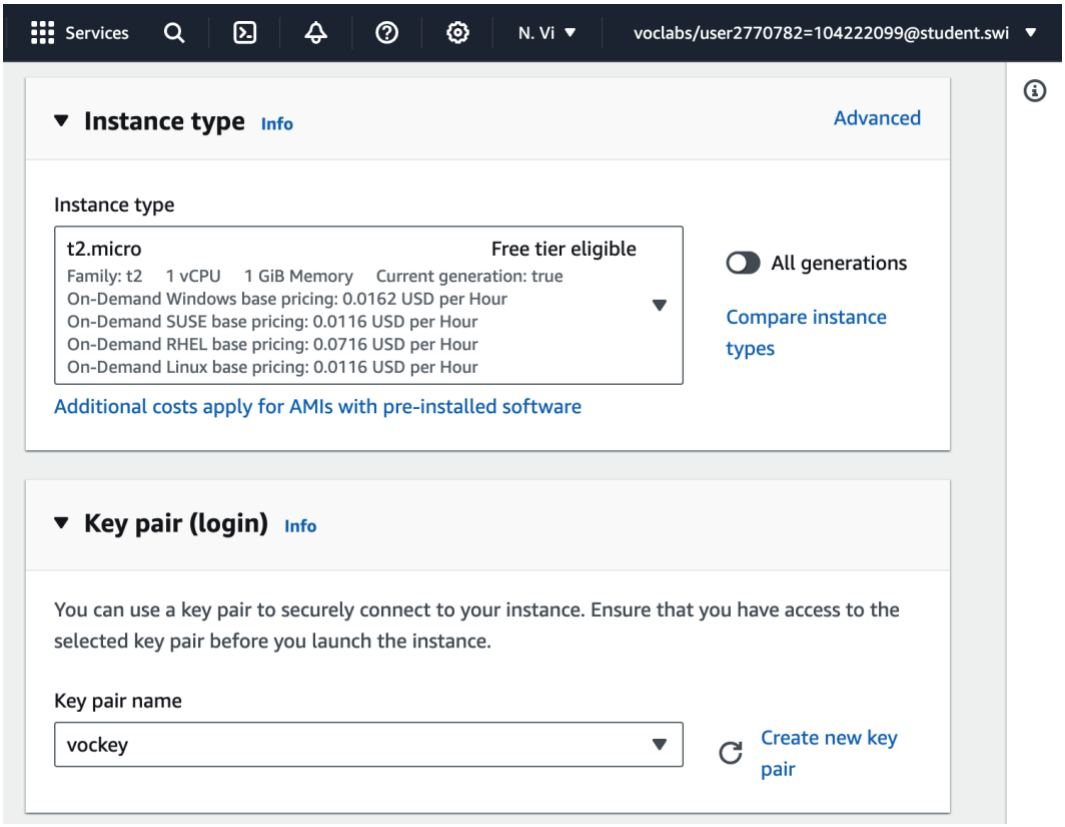
- Under **Auto Scaling guidance**, select *Provide guidance to help me set up a template that I can use with EC2 Auto Scaling*



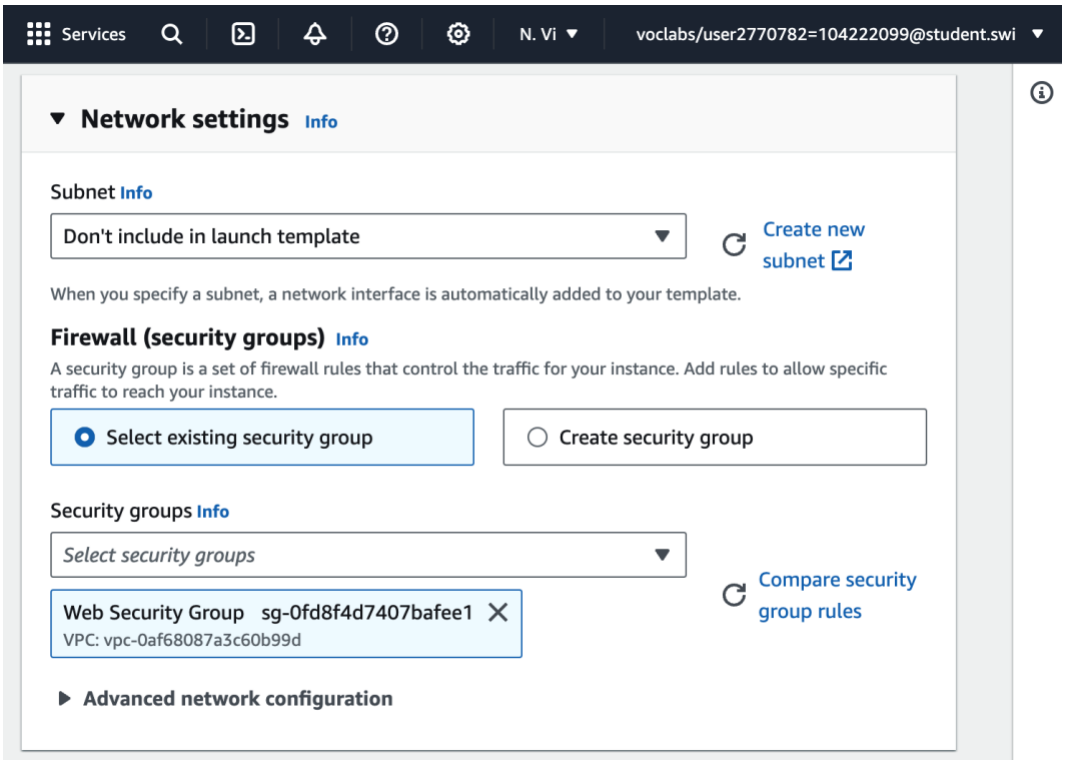
- In the Application and OS Images (Amazon Machine Image) area, choose *My AMIs*.
- **Amazon Machine Image (AMI)**: choose *Web Server AMI*



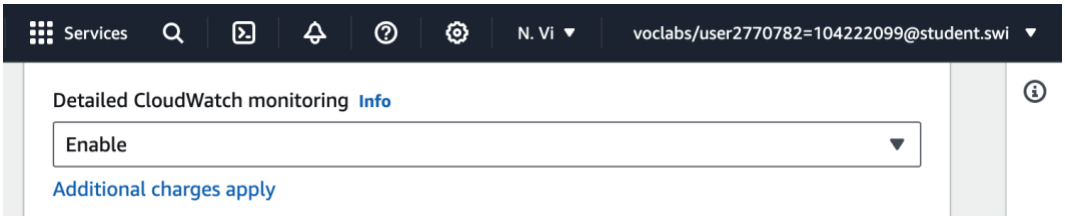
- **Instance type:** choose *t2.micro*
- **Key pair name**: choose *vockey*



- **Firewall (security groups)**: choose *Select existing security group*
- **Security groups**: choose *Web Security Group*

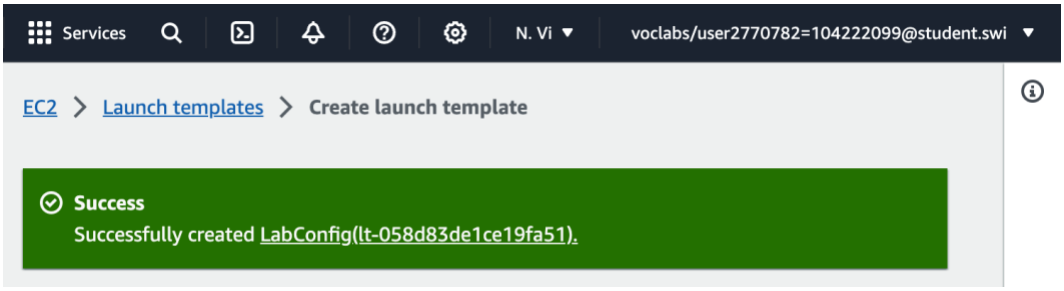


- Scroll down to the **Advanced details** area and expand it.
- Scroll down to the **Detailed CloudWatch monitoring** setting. Select *Enable*

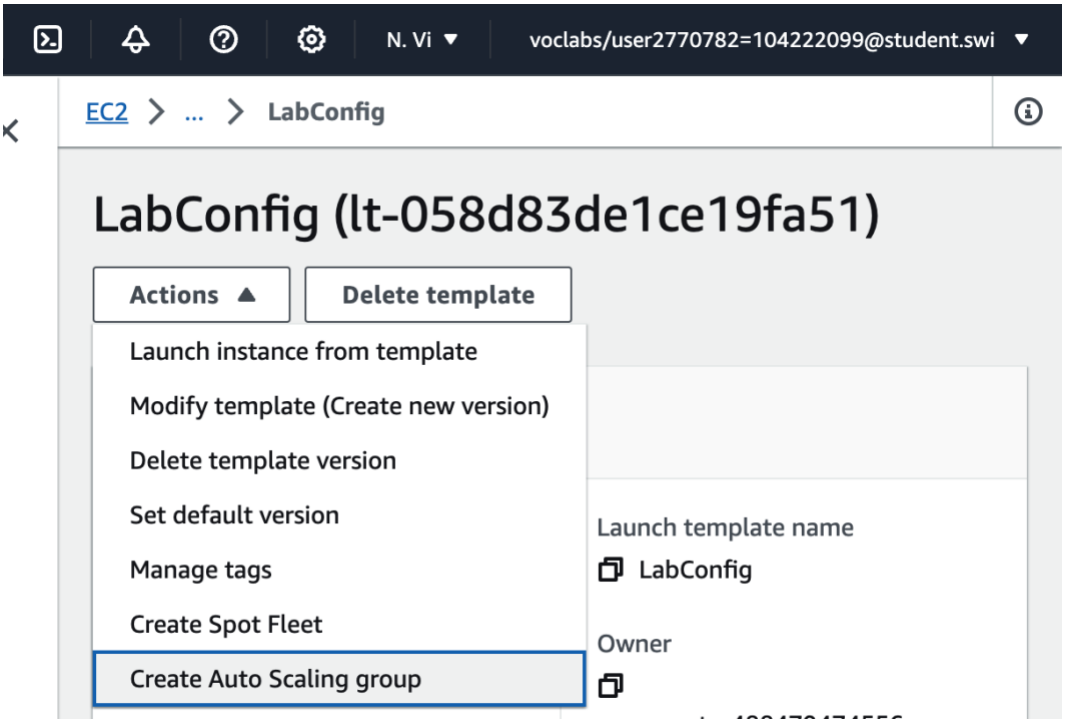


Choose **Create launch template**

In the Success dialog, choose the **LabConfig** launch template.

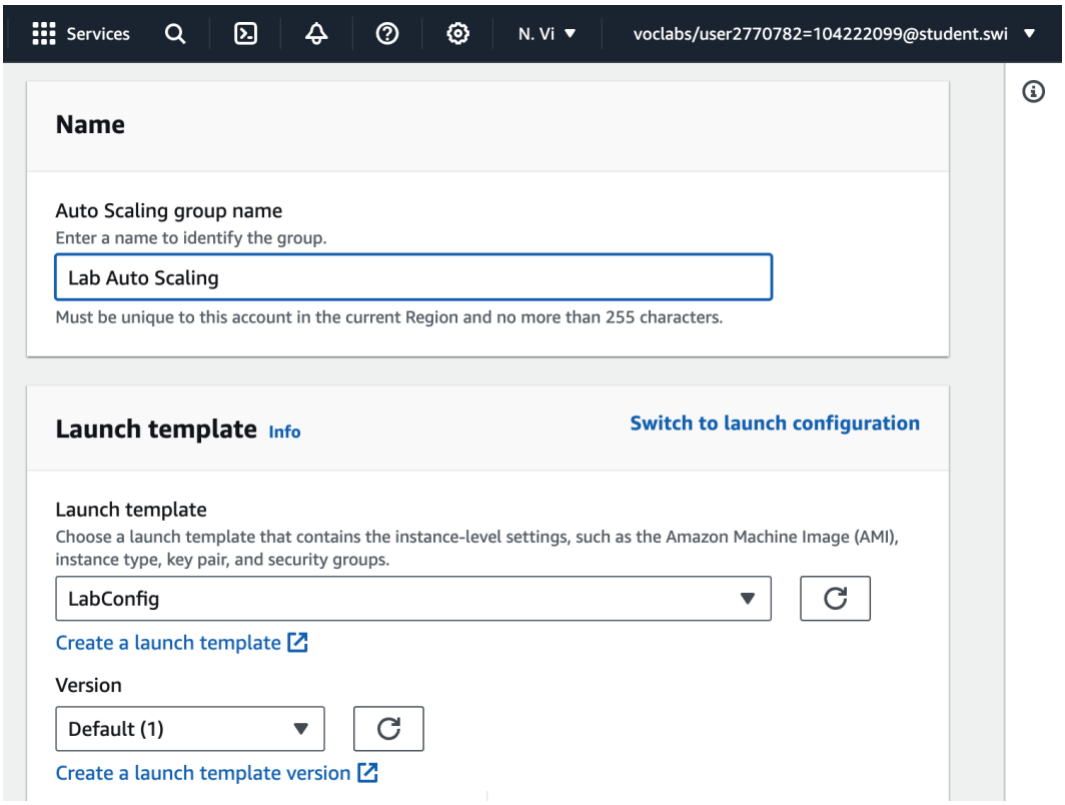


From the **Actions** menu, choose *Create Auto Scaling group*



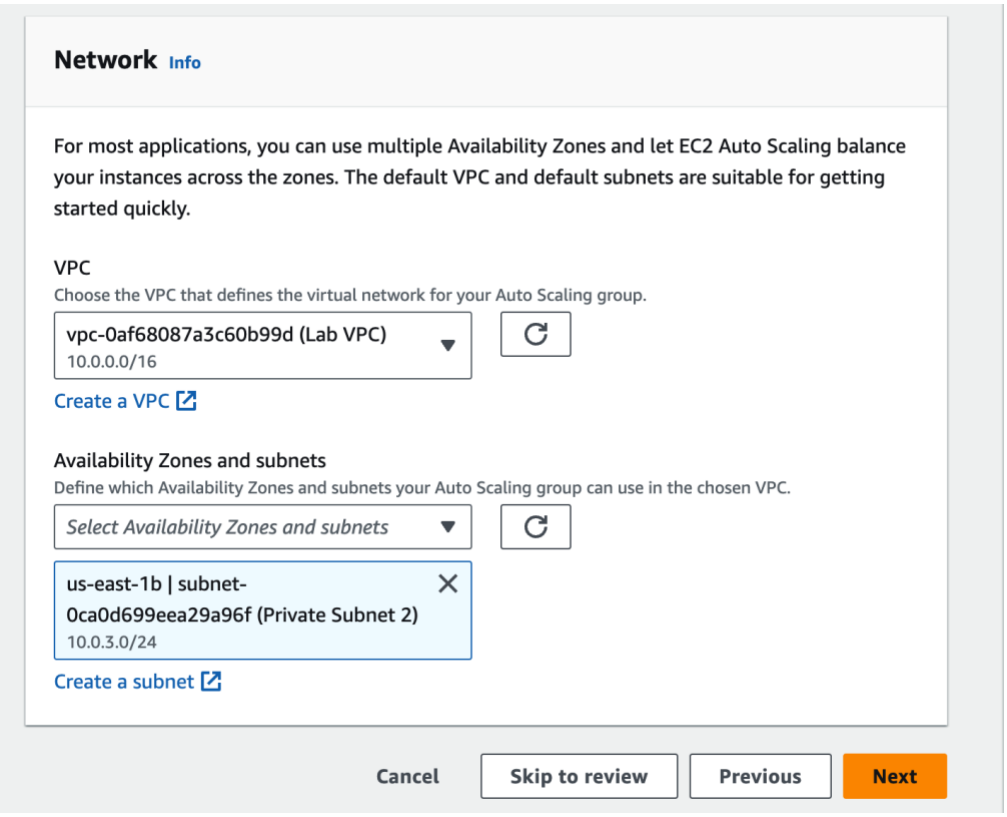
Configure the details in Step 1 (Choose launch template or configuration):

- **Auto Scaling group name:** Lab Auto Scaling Group
- **Launch template**: confirm that the *LabConfig* template you just created is selected.
- Choose **Next**



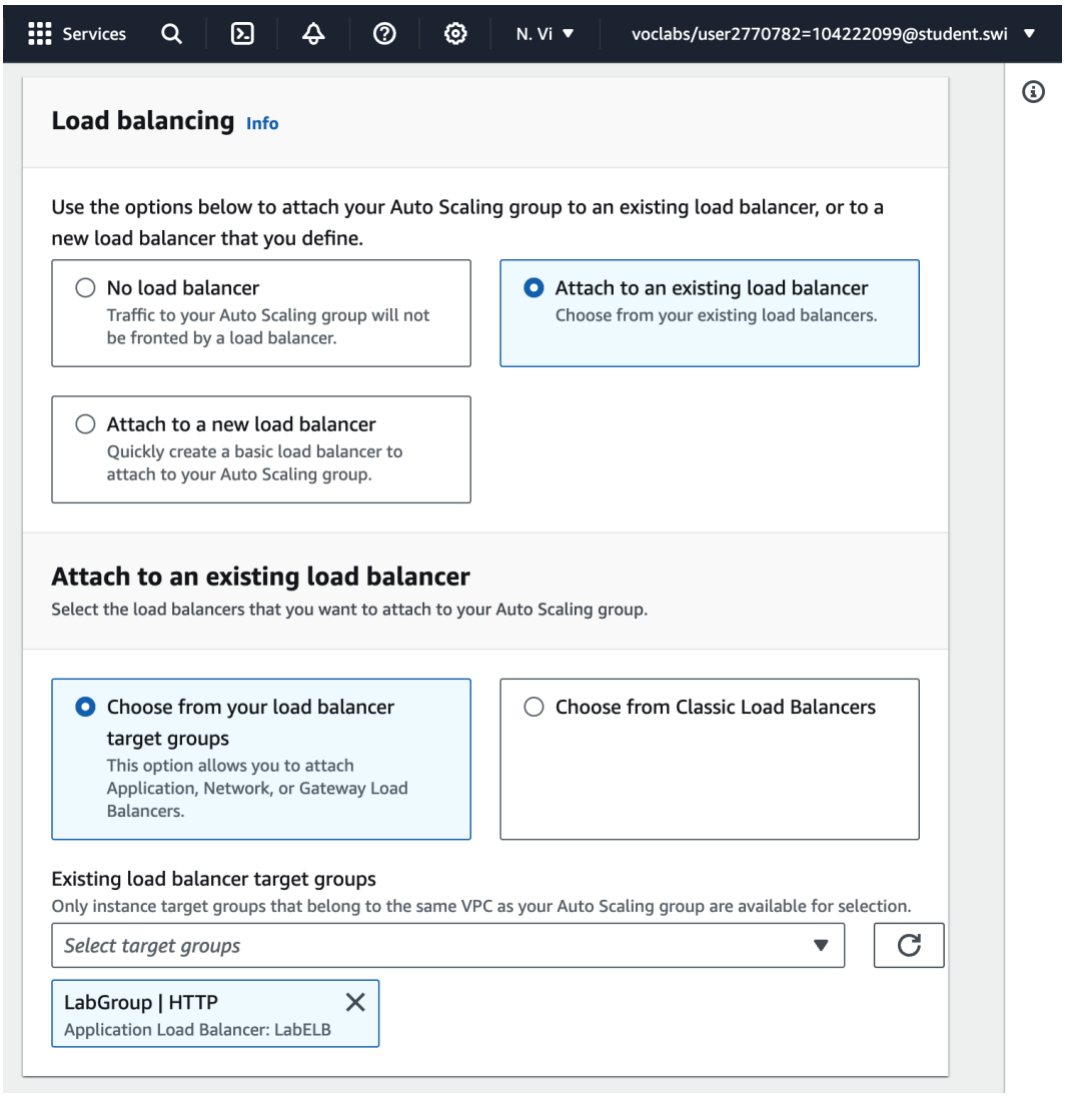
Configure the details in Step 2 (Choose instance launch options):

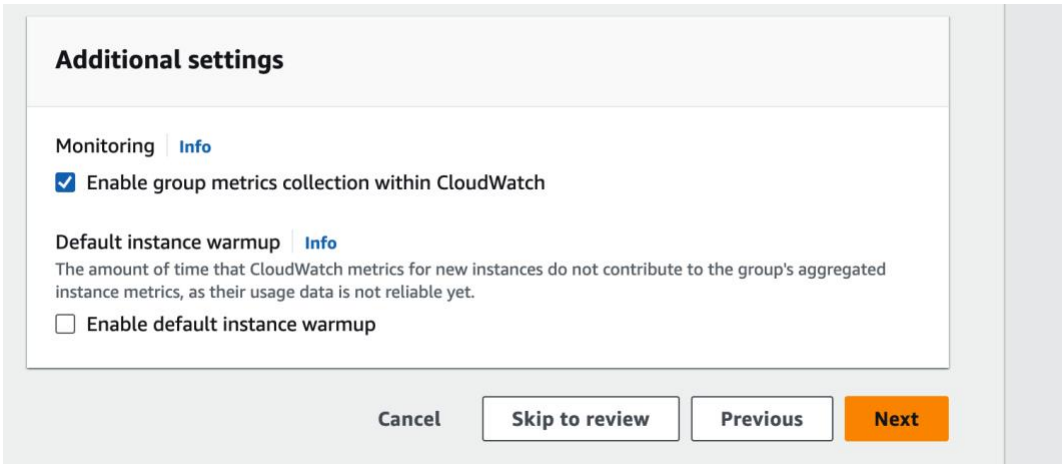
- **VPC**: choose *Lab VPC*
- **Availability Zones and subnets**: Choose *Private Subnet 1* and then choose *Private Subnet 2*.
- Choose **Next**



Configure the details in Step 3 (Configure advanced options):

- Choose **Attach to an existing load balancer**
    - **Existing load balancer target groups**: select *LabGroup*.
- In the **Additional settings** pane:
    - Select **Enable group metrics collection within CloudWatch**
- Choose **Next**

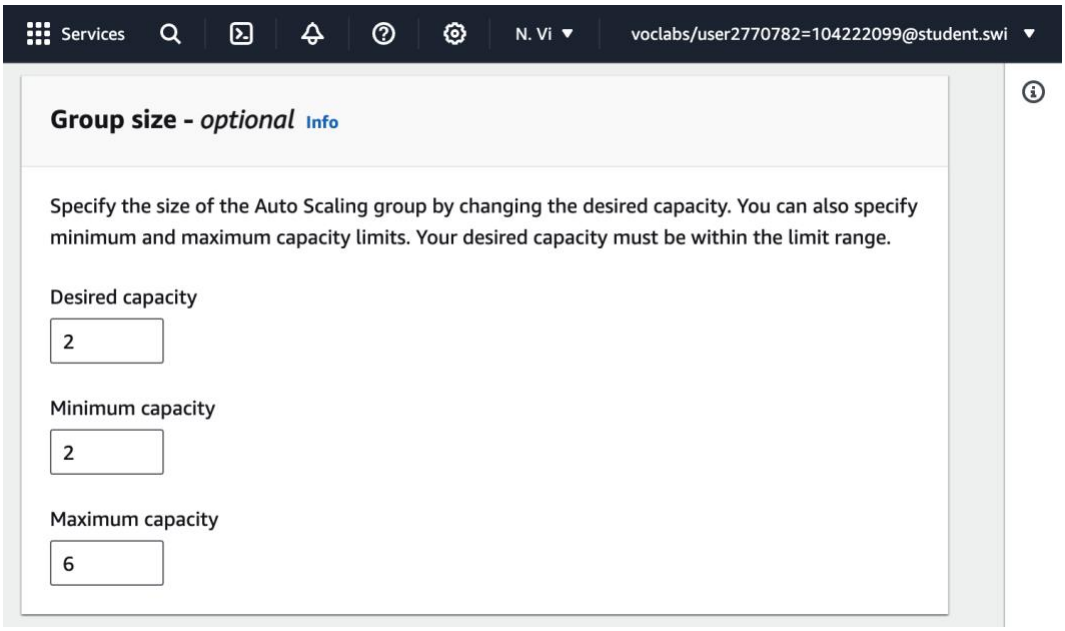




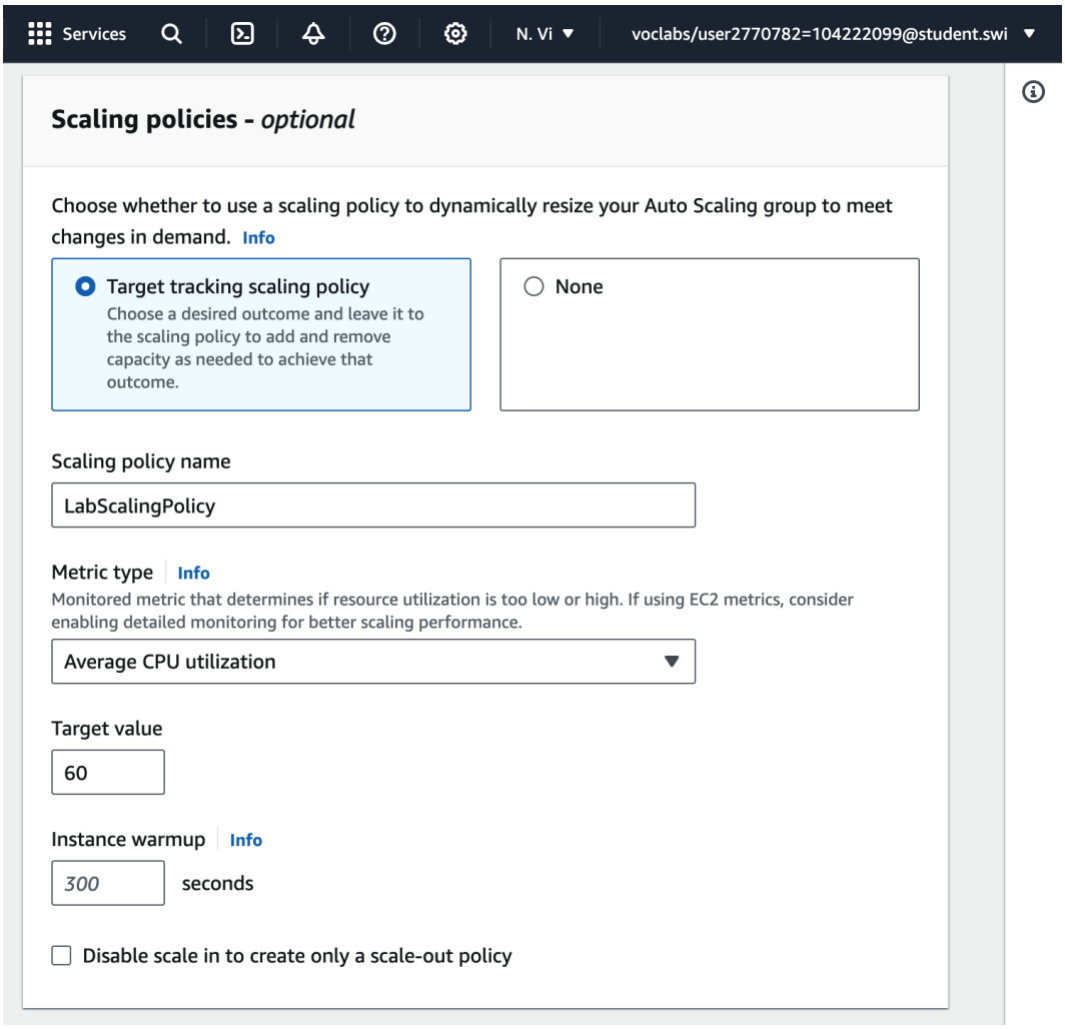
Configure the details in Step 4 (Configure group size and scaling policies - optional):

- Under **Group size**, configure:

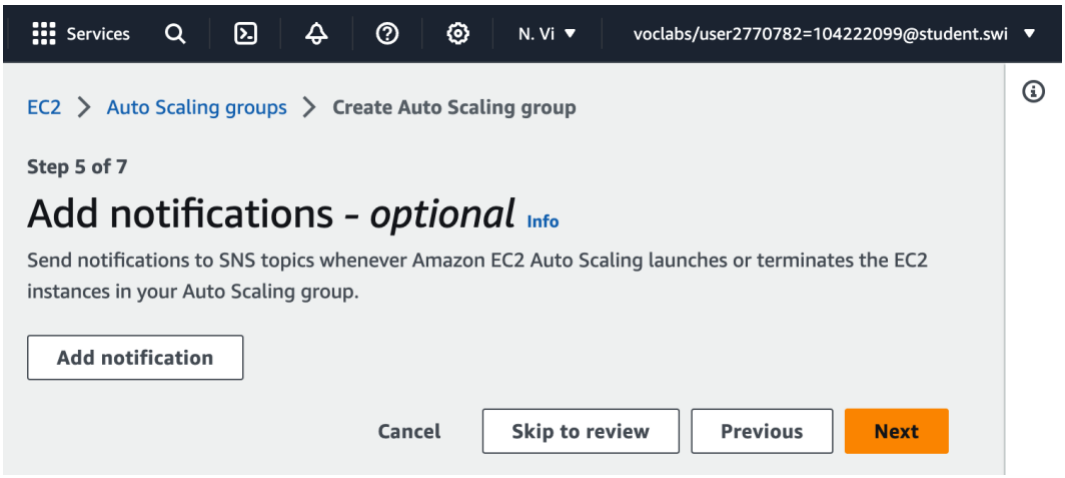
- **Desired capacity:** 2
- **Minimum capacity:** 2
- **Maximum capacity:** 6



- Under **Scaling policies**, choose *Target tracking scaling policy* and configure:
  - **Scaling policy name:** LabScalingPolicy
  - **Metric type:** *Average CPU Utilization*
  - **Target value:** 60



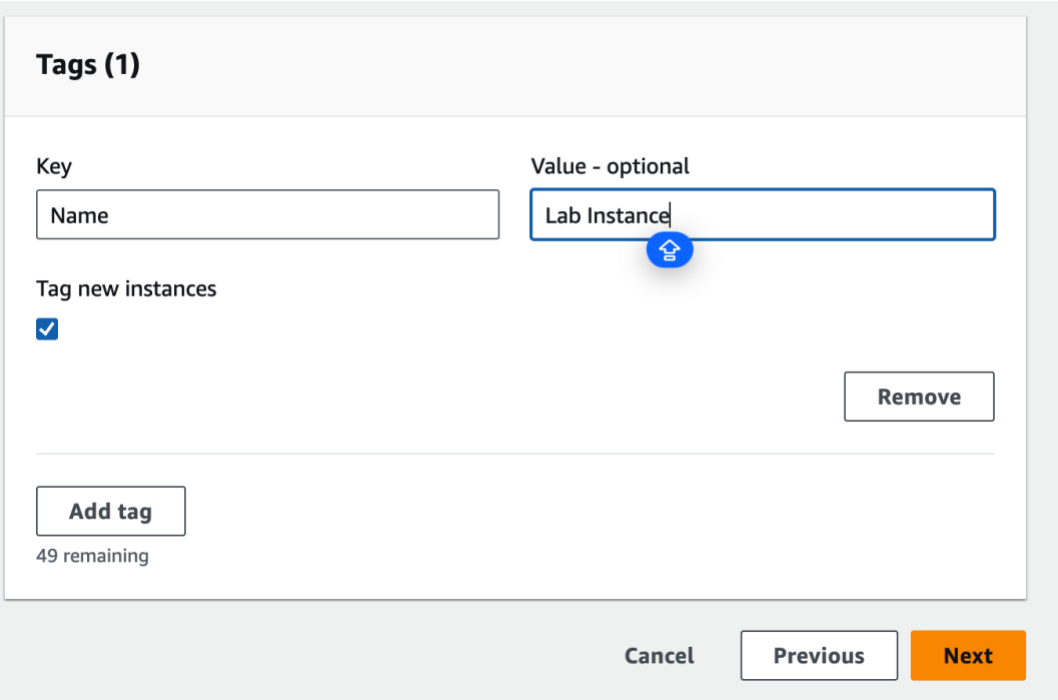
Configure the details in Step 5 (Add notifications - optional):



Configure the details in Step 6 (Add tags - optional):

Tags applied to the Auto Scaling group will be automatically propagated to the instances that are launched.

- Choose **Add tag** and Configure the following:
  - **Key:** Name
  - **Value:** Lab Instance
- Choose **Next**

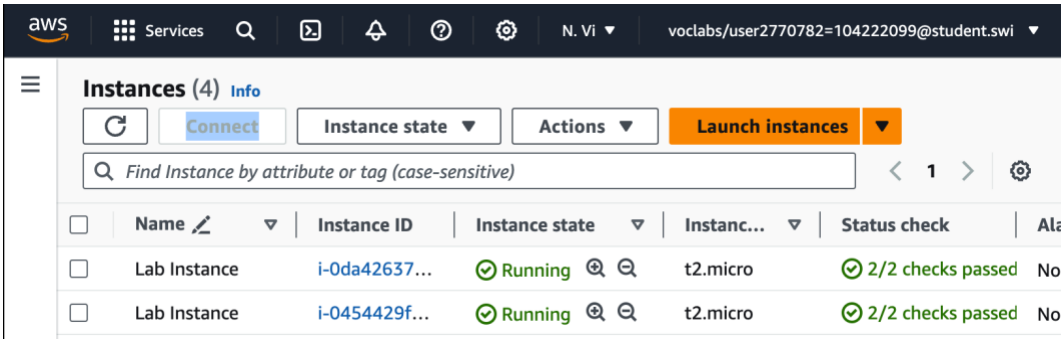


Configure the details in Step 6 (Review):

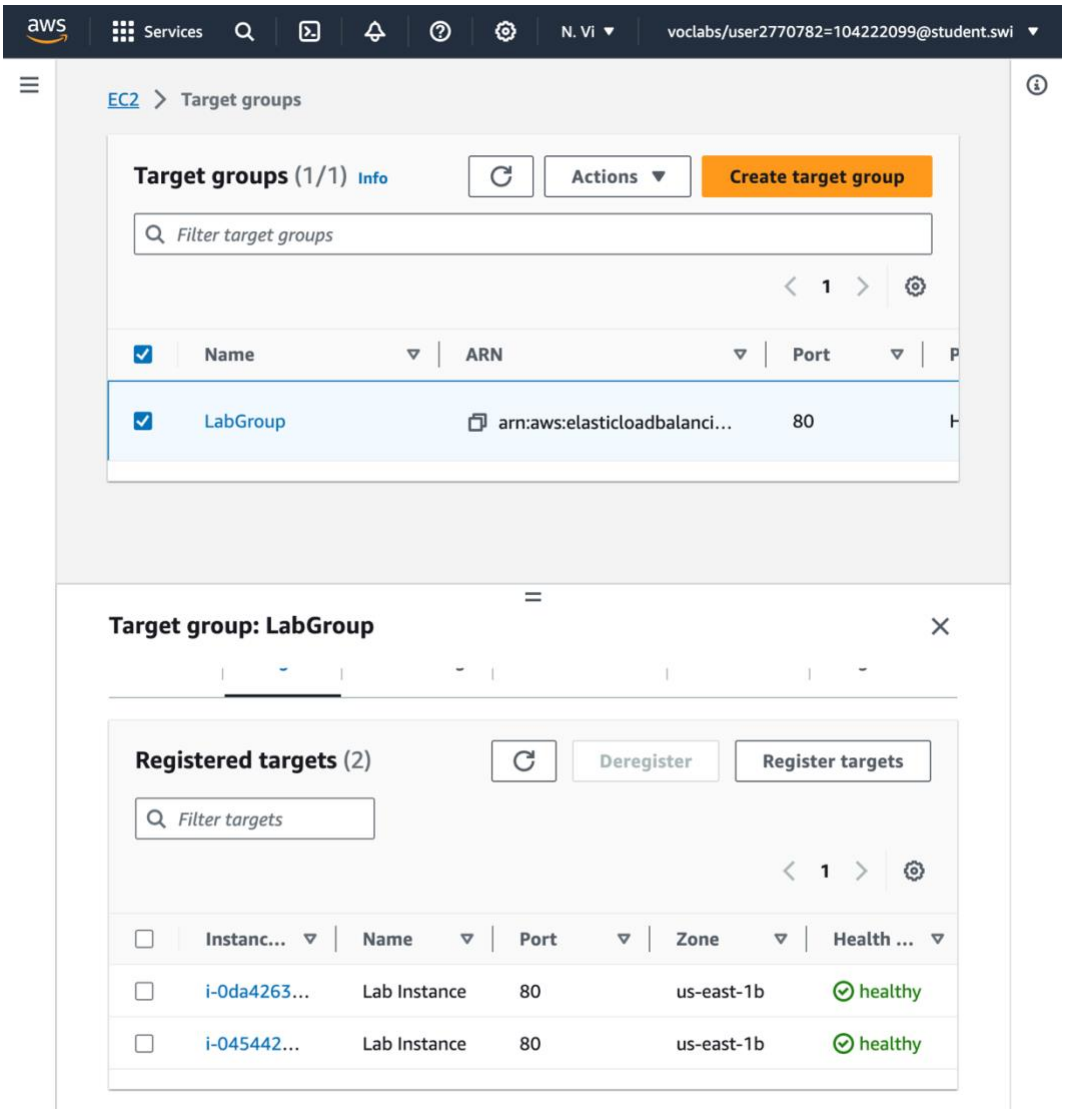
- Review the details of your Auto Scaling group
- Choose **Create Auto Scaling group**

Task 4: Verify that Load Balancing is Working

In the left navigation pane, choose **Instances**.
You should see two new instances named **Lab Instance**. These were launched by Auto Scaling.

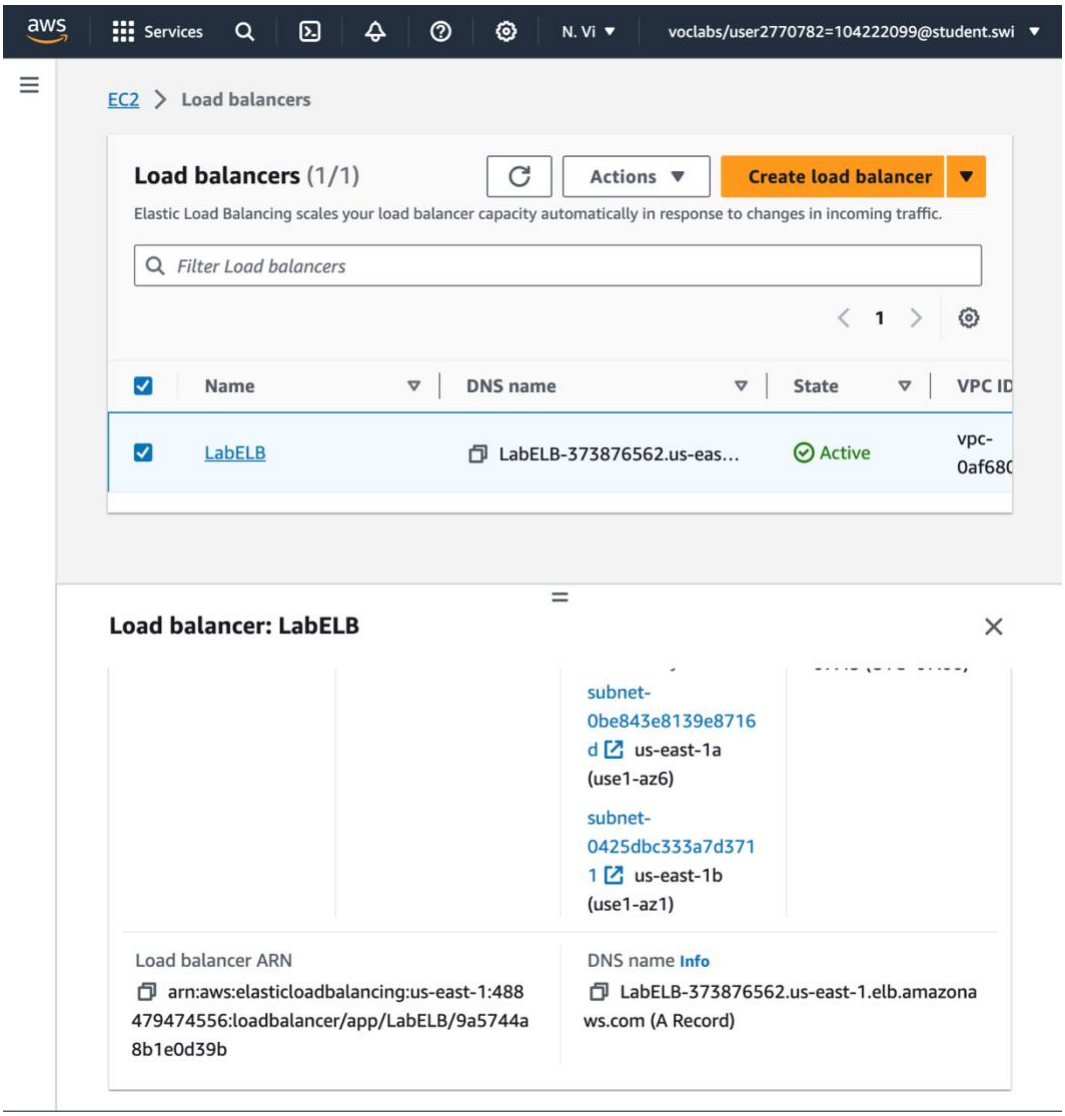


In the left navigation pane, choose **Target Groups**.
Select *LabGroup*
Choose the **Targets** tab.

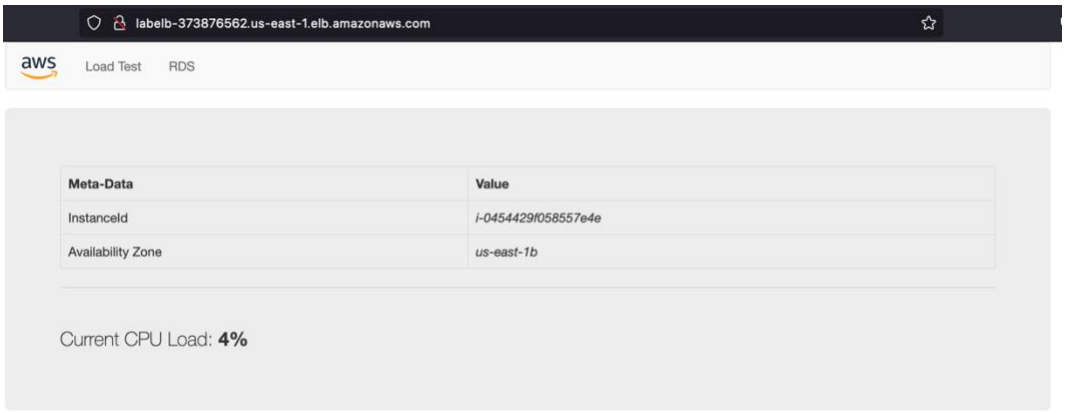


In the left navigation pane, choose **Load Balancers**.

Select the *LabELB* load balancer.
In the Details pane, copy the **DNS name** of the load balancer, making sure to omit "(A Record)".

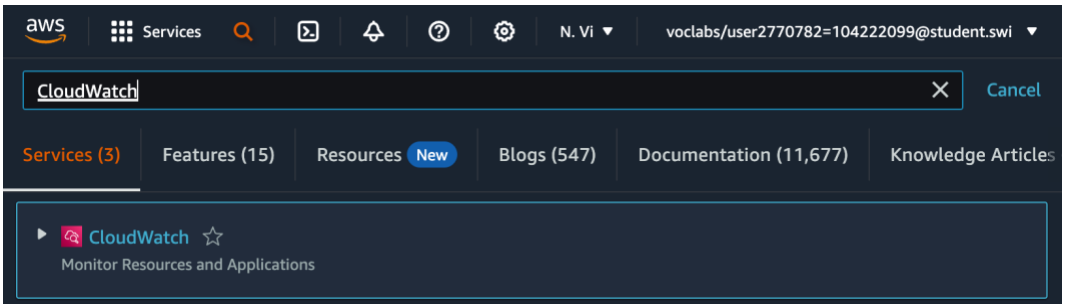


Open a new web browser tab, paste the DNS Name you just copied, and press Enter.

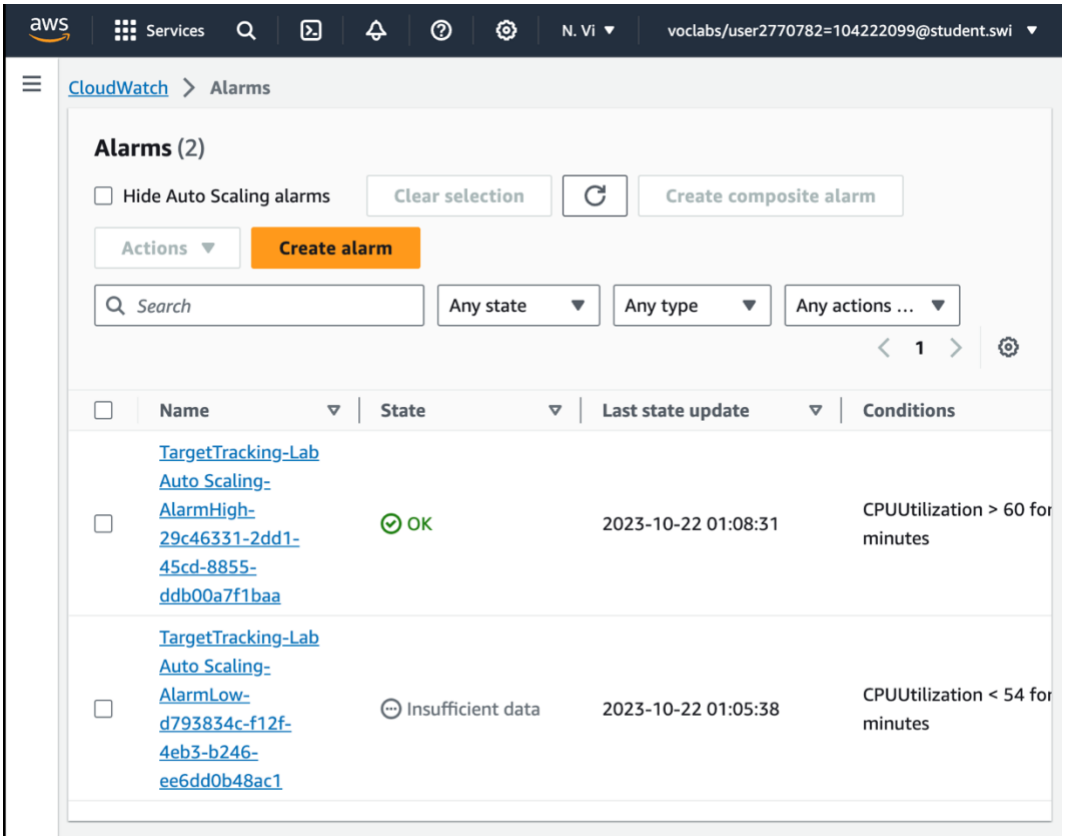


Task 5: Test Auto Scaling

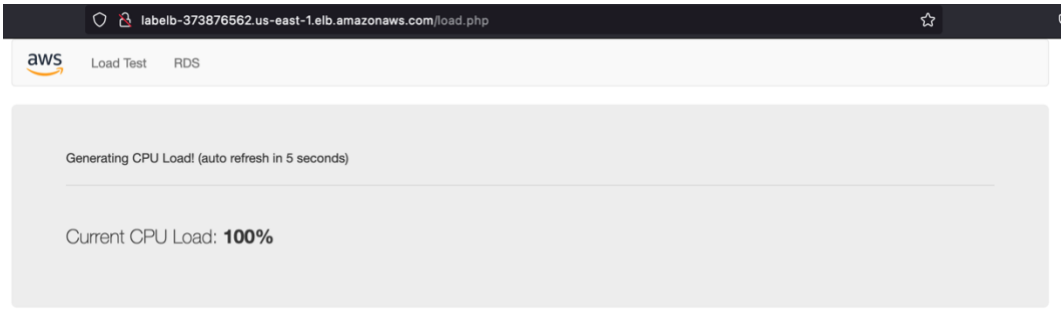
In the search box next to **Services** , search for and select **CloudWatch**.



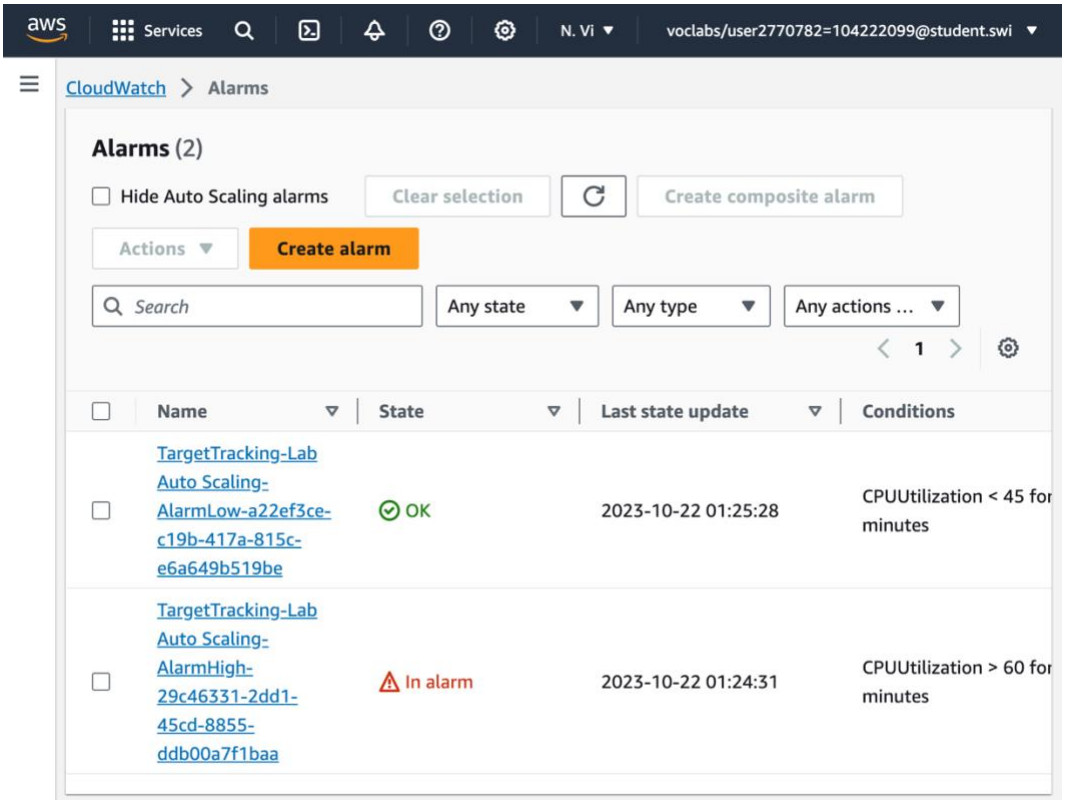
In the left navigation pane, choose **All alarms**.



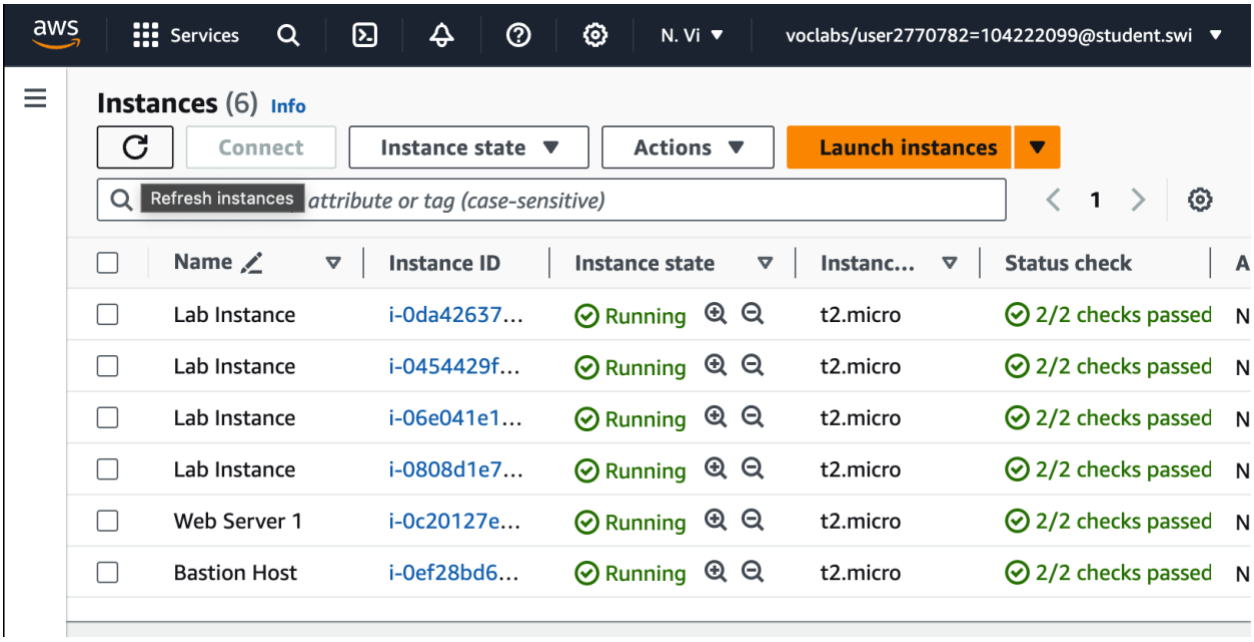
Choose the **OK** alarm, which has *AlarmHigh* in its name.
Return to the browser tab with the web application.
Choose **Load Test** beside the AWS logo.



Return to browser tab with the **CloudWatch** console.
Wait until the **AlarmHigh** alarm enters the *In alarm* state.

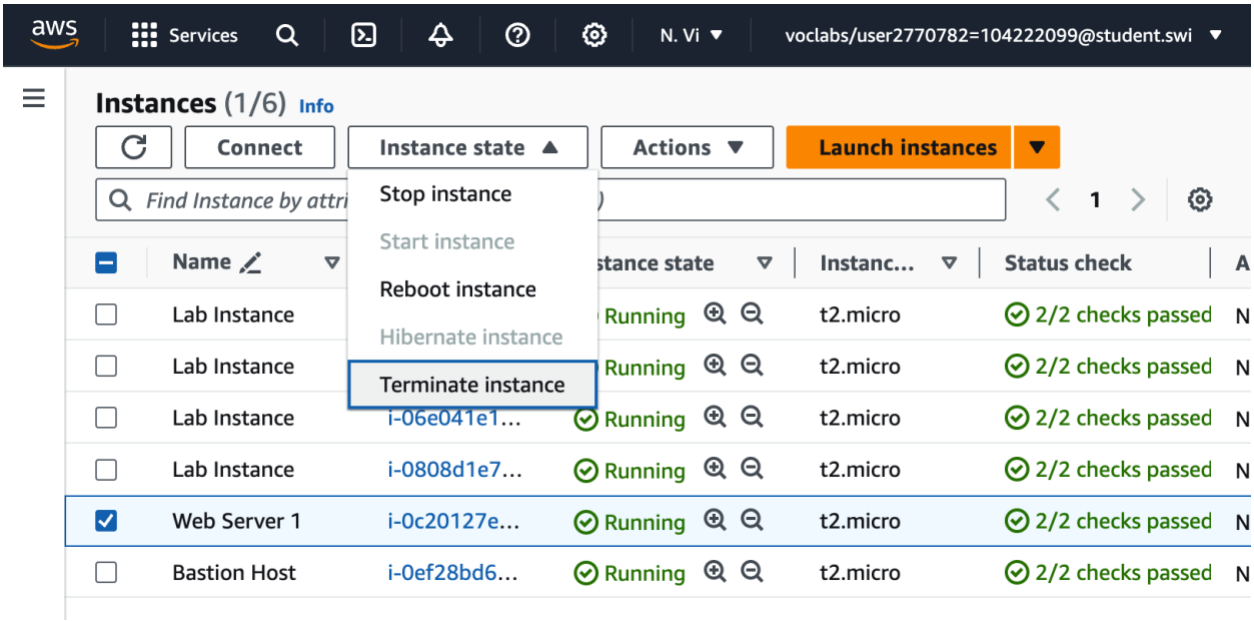


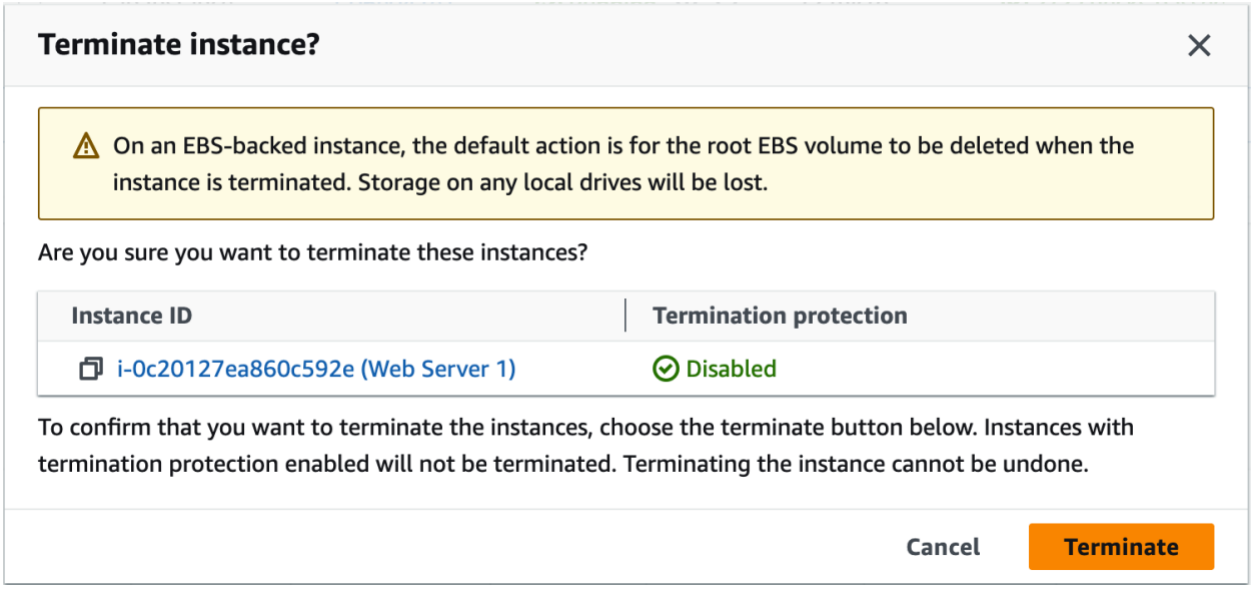
In the search box next to **Services** , search for and select **EC2**.
In the left navigation pane, choose **Instances**.



Task 6: Terminate Web Server 1

Select **Web Server 1** (and ensure it is the only instance selected).
In the **Instance state** menu, choose **Instance State** > **Terminate Instance**.
Choose **Terminate**





END LAB.