Develop and Deploy Images Gallery Application

(LAB-M04-02)

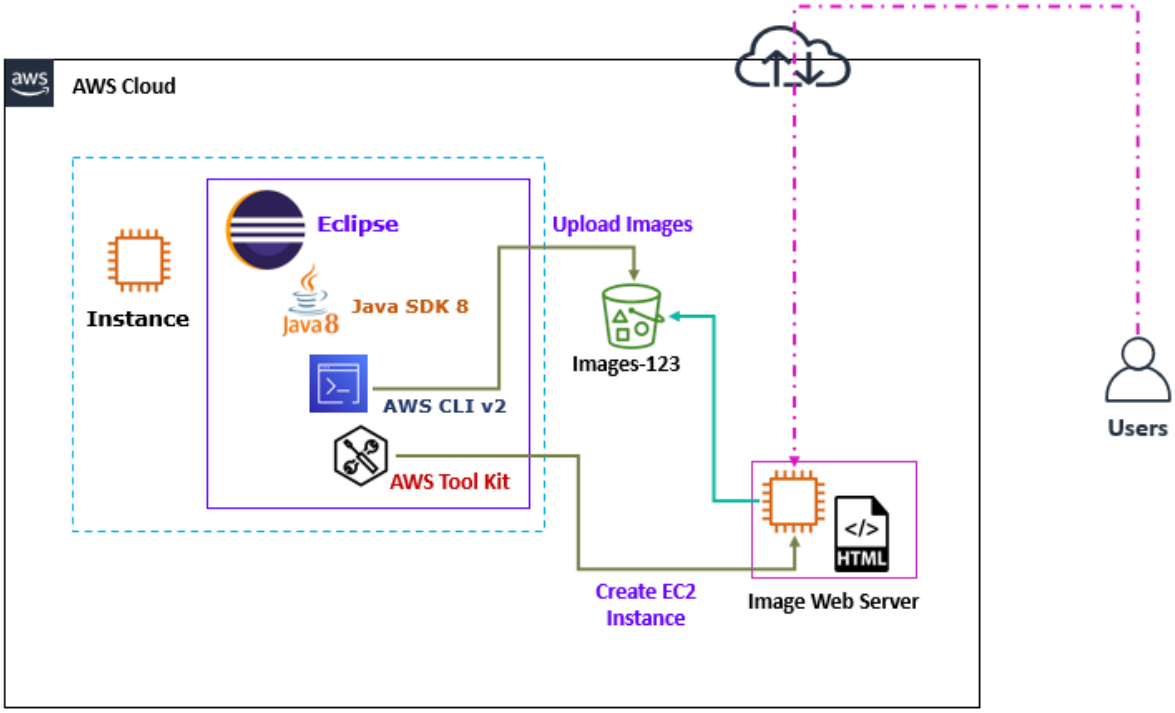
Lab scenario

You're preparing to develop web application that host images gallery. As a development group, your team has decided to use AWS EC2 and AWS S3 for application deployment.

Objectives

After you complete this lab, you will be able to:

- Deploy web application in EC2 instance.
- Host gallery Images in S3 bucket.



Task 1: Create IAM User

In this task, you will create AWS IAM User with Permission to manage EC2.

Step 1: Create IAM User

1. In the **AWS Management Console**, on the **Services** menu, click **IAM**.
2. Select **Users**.
3. Select **Add user**.

a. **User name**: Write **EC2-User**.

   i. **Access type**: Select **Programmatic access**.

   ii. Select **Next: Permissions**.

b. Select **Attach existing policies**.

   i. Search and Select **AmazonEC2FullAccess**.

   ii. Select **Next: Tags**.

   iii. Select **Next: Review**.

c. Select **Create users**.

d. Select **Download .csv** file, to download the **Access key Id** & **Secret Access key details** in your local desktop/ laptop.

Task 2: Configure AWS Credential Profile

In this task, you will configure new AWS credential profile to manage EC2 instances.

Step 1: Create New AWS Credential Profile

4. **From** the **Dev Instance**, right click on **Start** & **Run**.

   a. In the **Open**, write **C:\Users\Administrator**, press **Ok**.

   b. **Open** the, **.aws** folder.

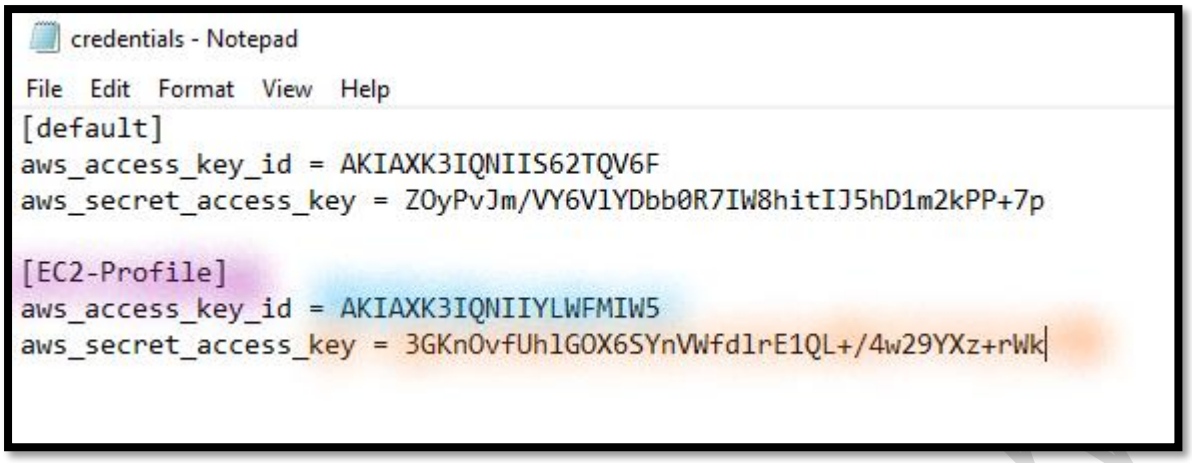
   c. **Open** the **Credentials** file in **Notepad**.

   d. **Add** the ***below credential profile*** in the **Credentials** file, after default profile.

```
[EC2-Profile]
aws_access_key_id =
aws_secret_access_key =
```

   i. **aws_access_key_id**: **Type** the IAM User **EC2-User** **access key**.

   ii. **aws_secret_access_key**: **Type** the IAM User **EC2-User** **secret access key**.

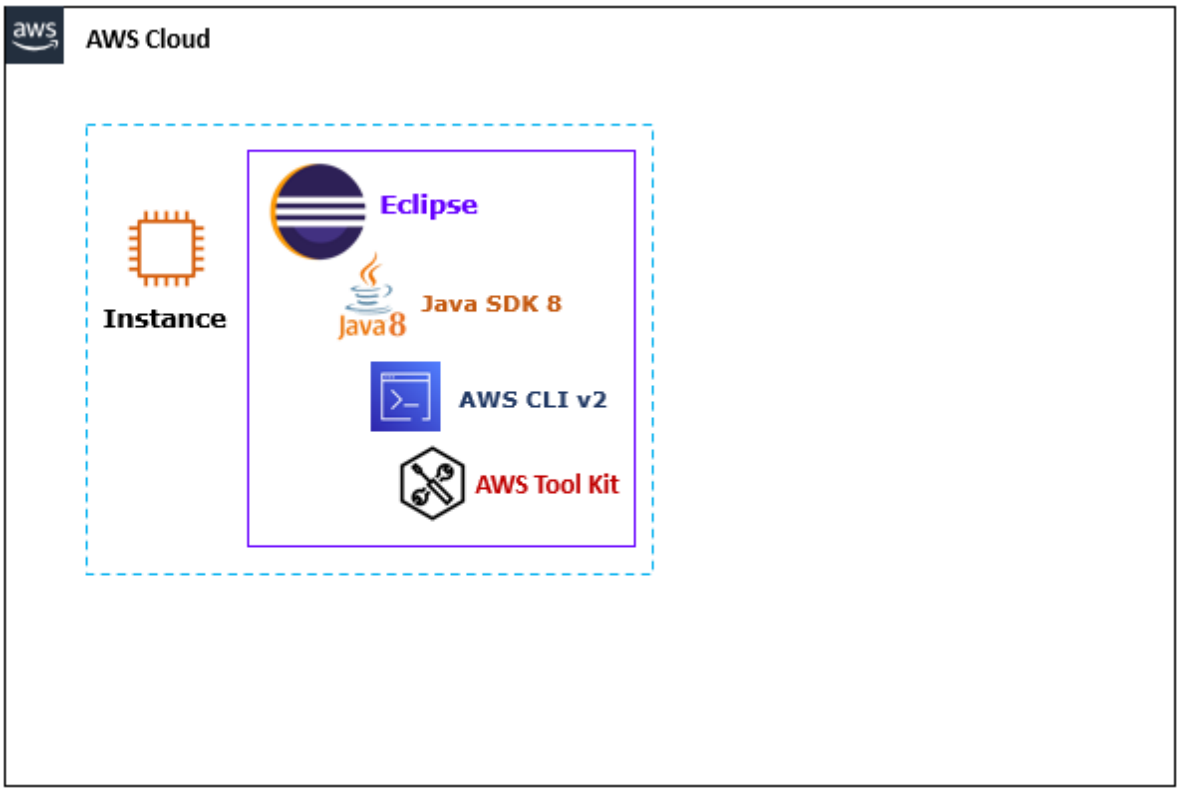


iii. Select **File** and Select **Save**.

iv. **Close** the ***Credential*** file.

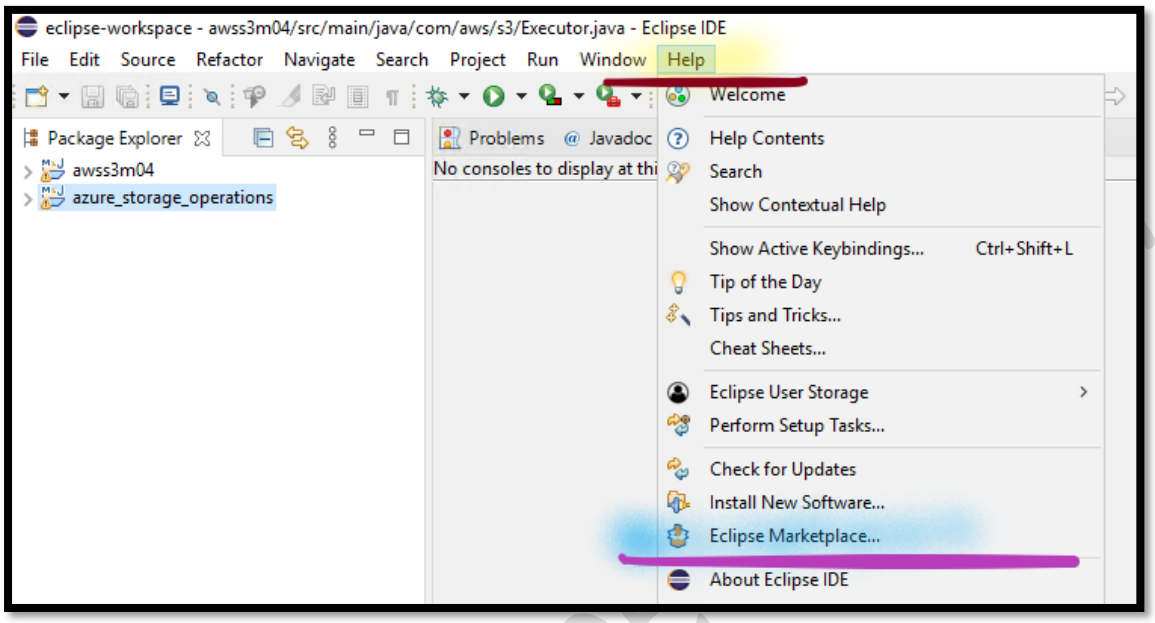
Task 3: Install AWS Toolkit for Eclipse

In this task, you will install the AWS Toolkit for Eclipse to manage the AWS resources from Eclipse.

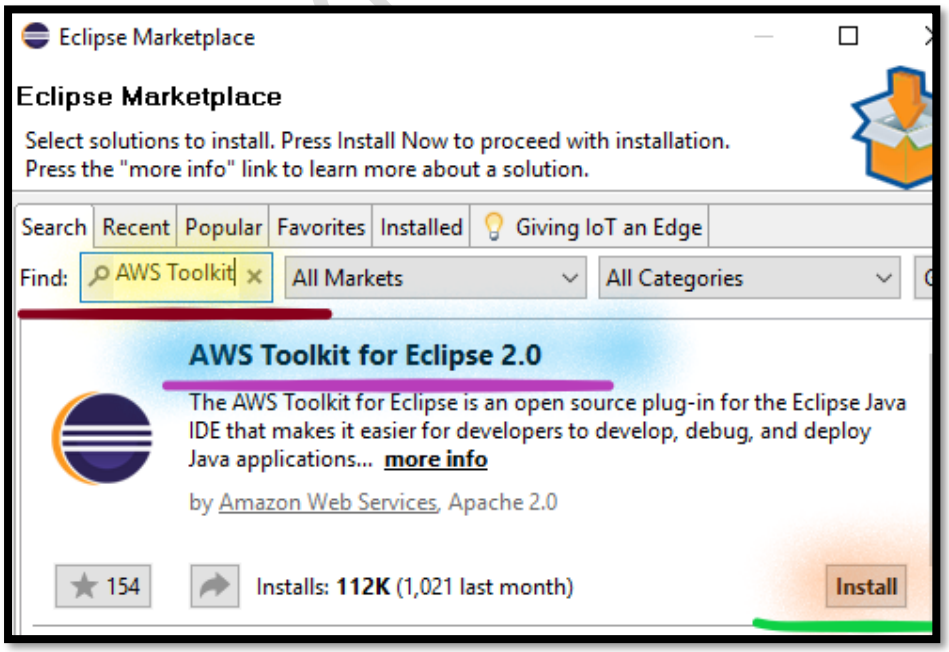


Step 1: Install AWS Toolkit for Eclipse

5. **From** the **Eclipse IDE**.
   a. Select **Help**.
   b. Select **Eclipse marketplace**.



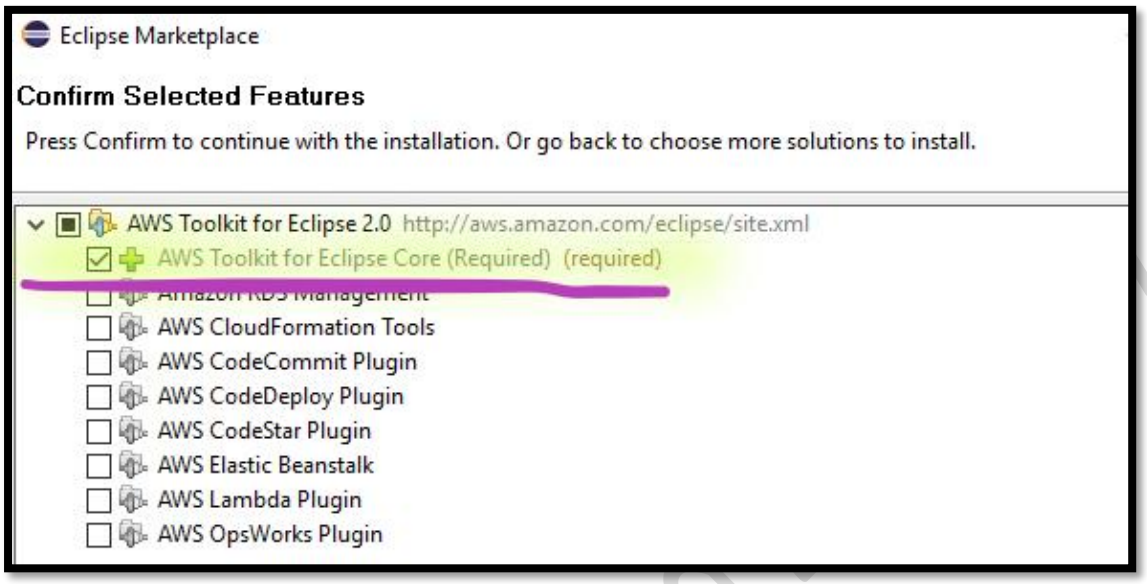
   c. **From** the **Eclipse marketplace** page:
      i. **Find**: In the **Search box**, Type **AWS Toolkit** and **Enter**.
      ii. **Click** on **Install** under ***AWS Toolkit for Eclipse***.



d. **From** the **Confirm Selected Features** page:

i. **Select** ***AWS Toolkit for Eclipse Core***.

ii. **Unselect** the ***other Tools/ Plugins***.



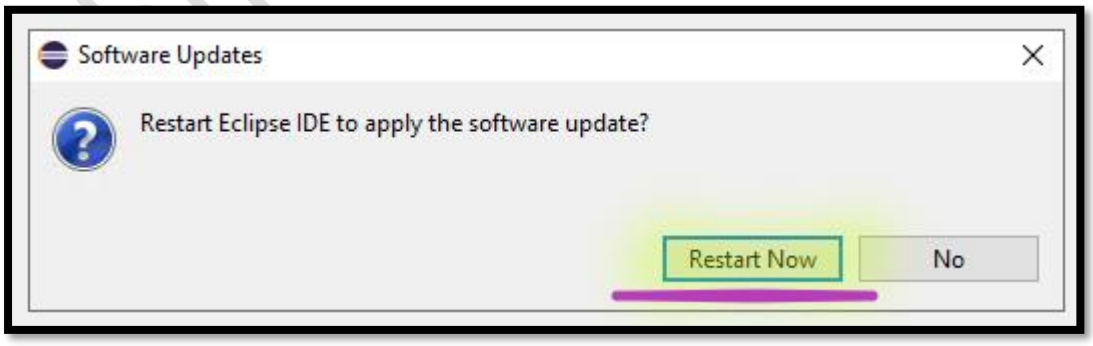
iii. Click on **Confirm**.

iv. **Select** the ***I accept the terms of the license agreement***.

v. Click on **Finish**.

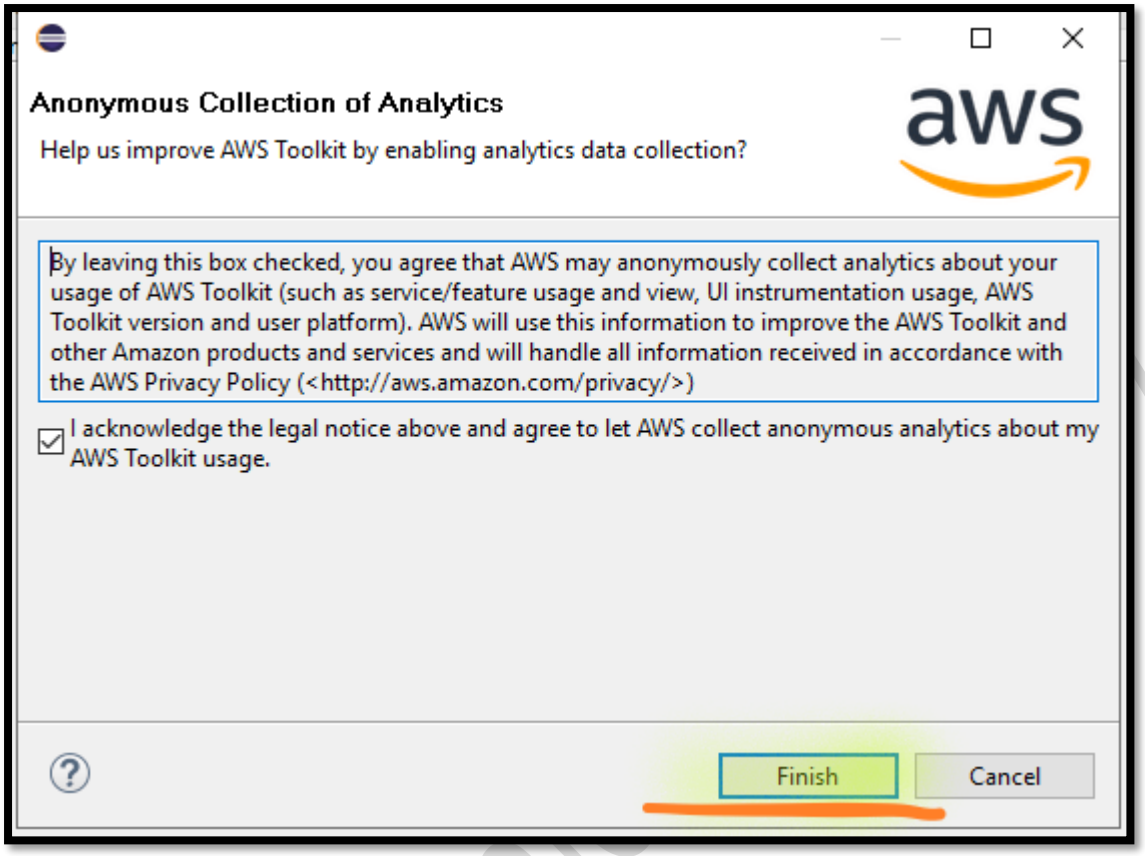
Note: **Wait** till software update gets installed succesfully.

vi. Once you ***get prompt***, to restart the **Eclipse IDE**, click on **Restart Now**.



Note: **Wait** till Eclipse IDE gets open.

vii. New page of ***Anonymous Collection of Analytics*** gets popup, click on **Finish**.



Task 4: Configure the AWS Toolkit for Eclipse

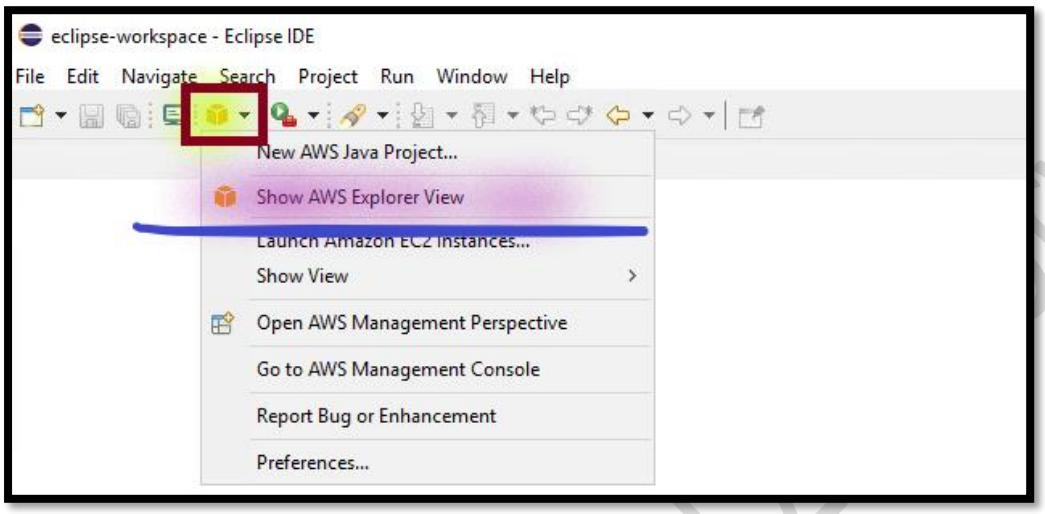
In this task, you will configure the AWS Toolkit for Eclipse to use AWS Credentials.

Step 1: Copy the .PEM file in Dev Instance

6. **From** the **Local Desktop/ Laptop**.
   a. **Copy** the **My-Dev-LAB-KP**.pem file which you have created in the previous step.
7. **From** the **Dev Instance**, right click on **Start** & **Run**.
   a. In the **Open**, write **C:\Users\Administrator**, press **Ok**.
   b. **Open** the, **.ec2** folder.
   c. **Paste** the **My-Dev-LAB-KP**.pem file which you have copied in the previous step.

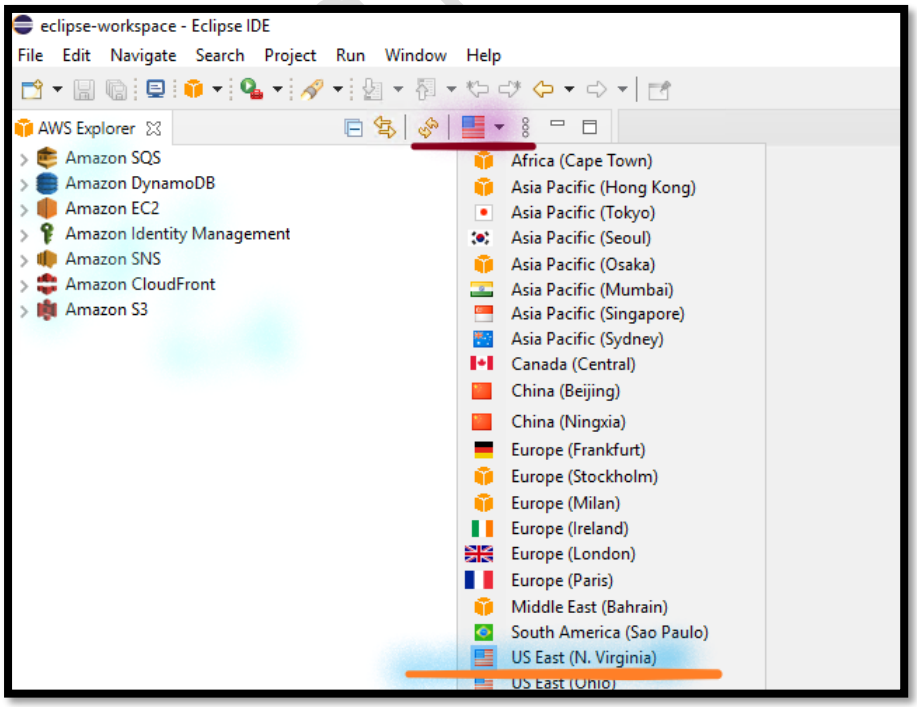
Step 2: Configure the AWS Region

8. **From** the **Eclipse IDE**.
   a. Select **AWS**.
   b. Select **Show AWS Explorer View**.

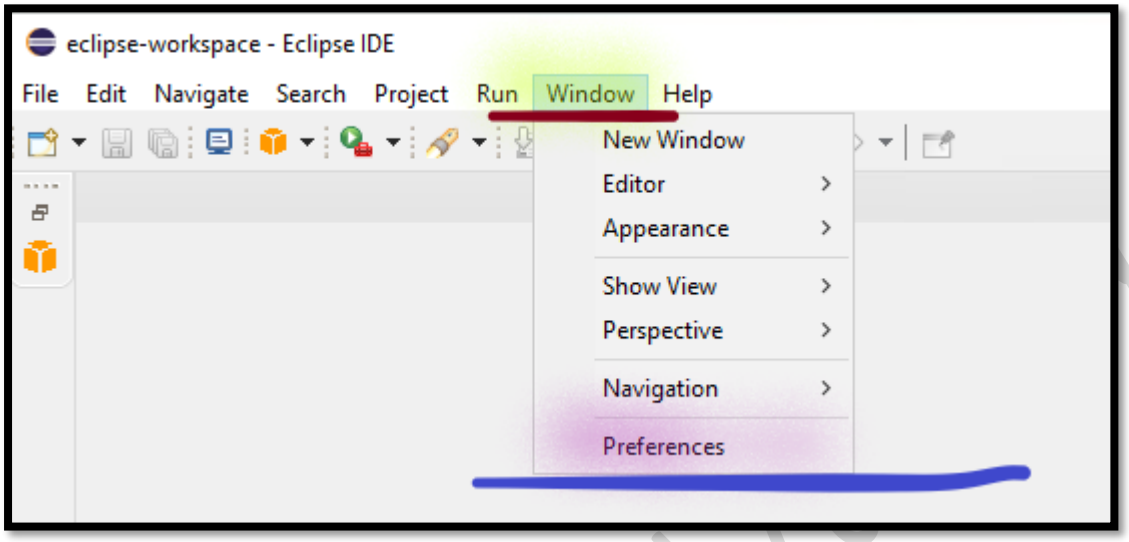


Note: You can now see the AWS Explorer to manage AWS Services.

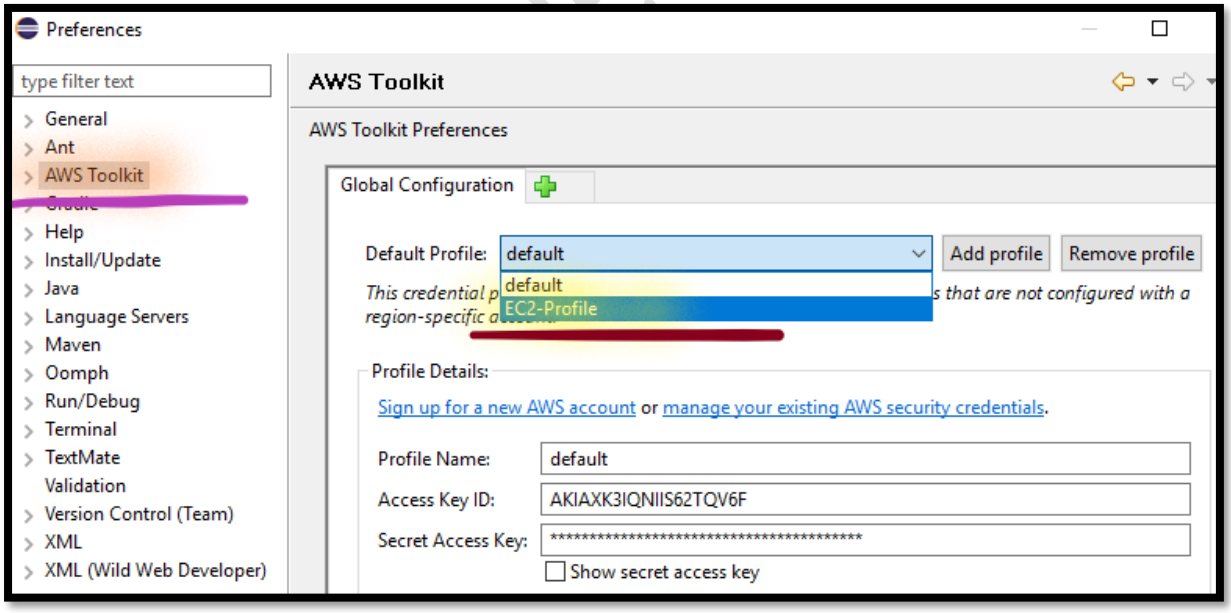
9. **From** the **AWS Explorer**.
   a. Select **Region**.
   b. Select **US East (N. Virginia)** region.



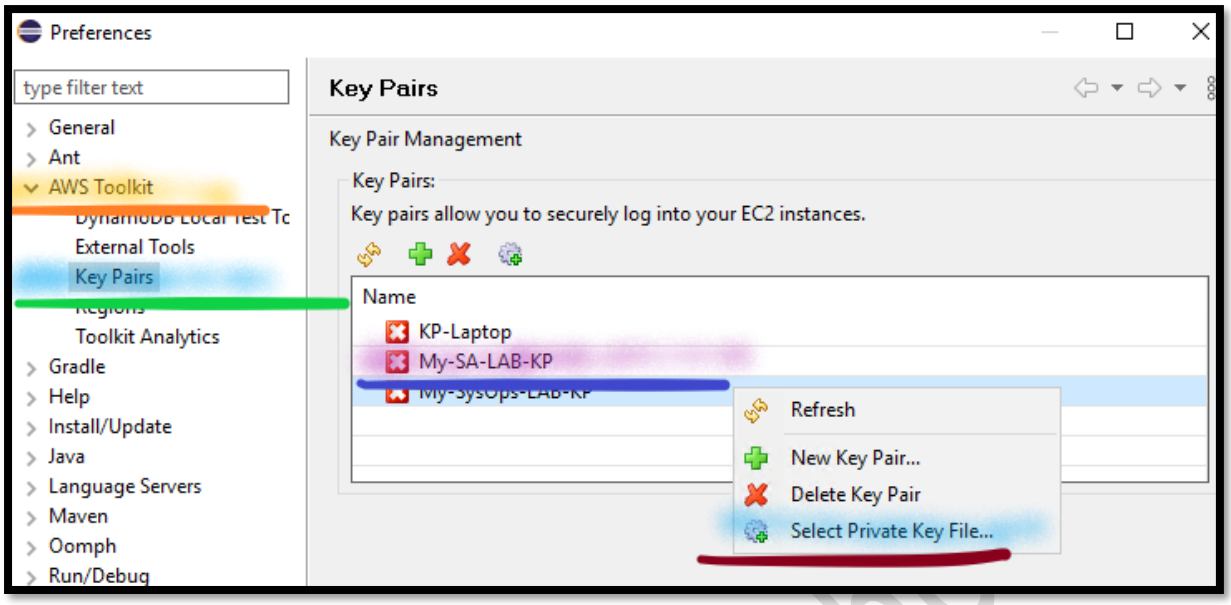
10. **From** the **Eclipse IDE**.
    a. Select **Window**.
    b. Select **Preferences**.



    c. Click on **AWS Toolkit**.
        i. **Default profile**: Dropdown and Select **EC2-Profile**.



    d. **Expand** the **AWS Toolkit**.
        i. Click on **Key Pairs**.
            1) **Right-click** on the **My-Dev-LAB-KP** Keypair and Select **Private Key File**.



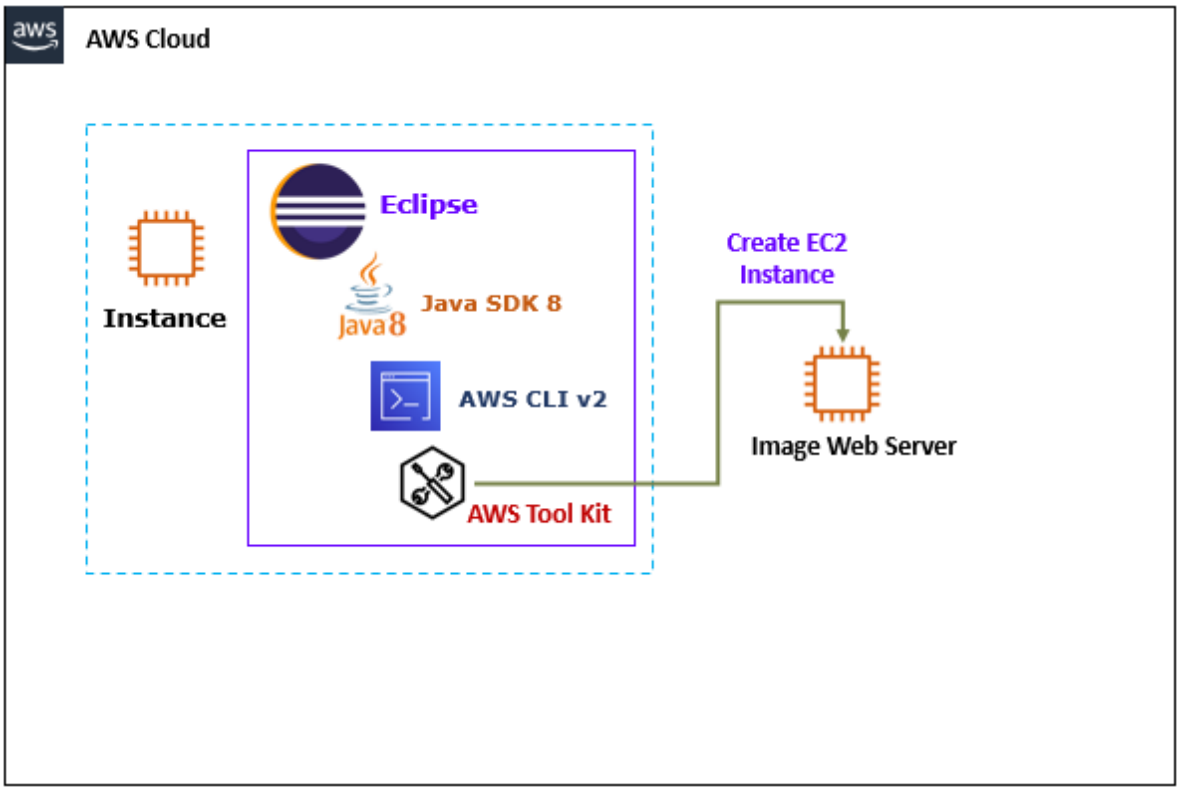
2) **Navigate** and browse to **C:\Users\Administrator\.ec2** folder and Select **My-Dev-LAB-KP.pem** file.

3) Select **Open**.

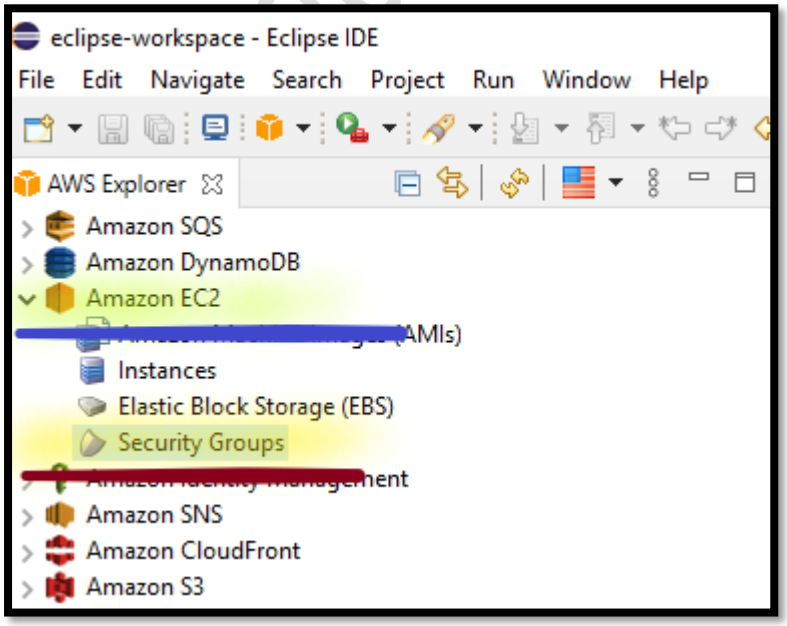
ii. Select **Apply and Close**.

Task 5: Deploy Web Server from AWS Toolkit

In this task, you will create virtual machine to deploy web application.



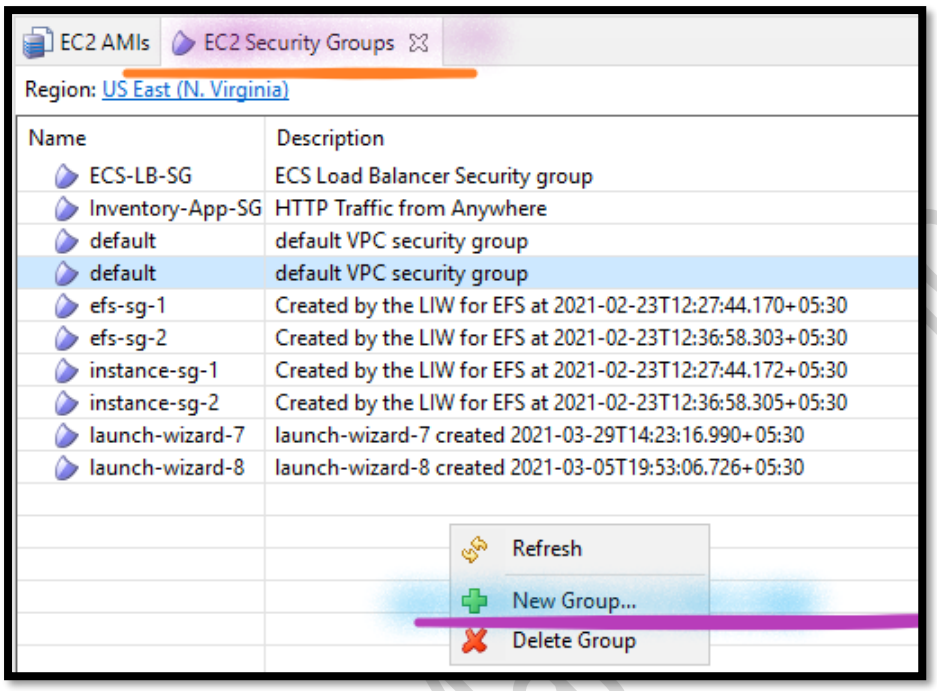
11. **From** the **AWS Explorer**.
    a. **Expand Amazon EC2**.
    b. Click on **Security Group**.



Note: New window gets open and display all the Security Groups.

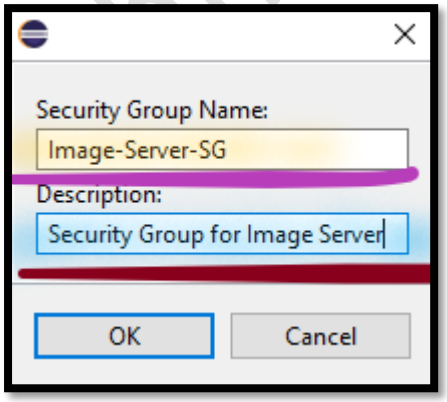
c. **From** the **EC2 Security Groups**:

i. **Right-Click** in the ***EC2 security group section*** and ***Select*** **New Group**.



ii. **For** the ***Security Groups***:

- **Security Group name**: Type **Image-Server-SG**.
- **Description**: Type **Security Group for Image Server**.



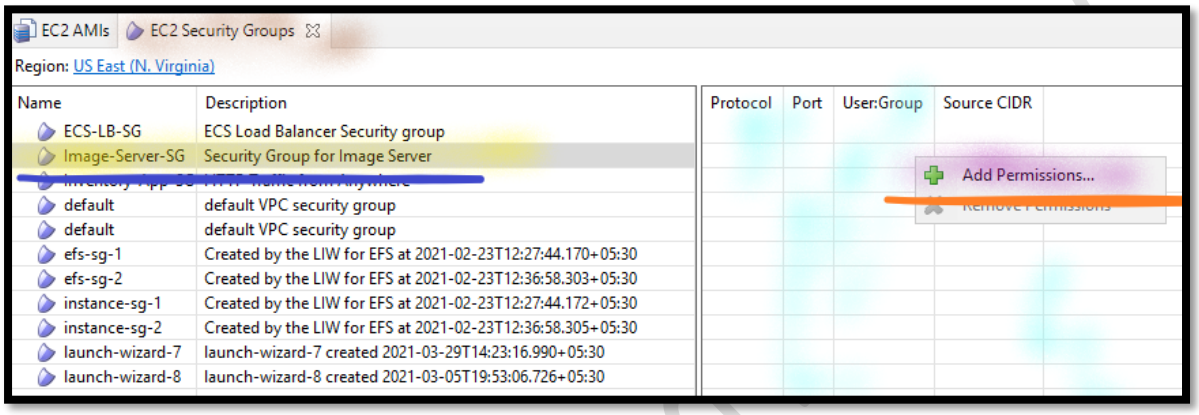
- Select **OK**.

Note: New window gets open and display all the Security Groups.

d. **From** the **EC2 Security Groups**:

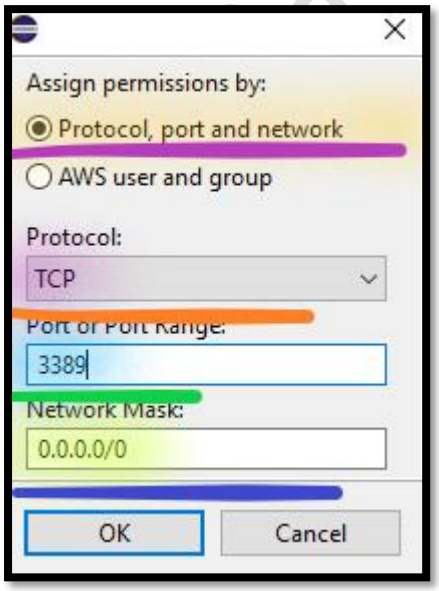
i. **Double-Click** in the **Image-Server-SG** ***security group***.

ii. **Go to the right-side** in ***Protocol/ Port*** section, **Right-Click** and ***Select*** **Add permissions**.



iii. **For** the ***Security Groups rule***:

- Select **Protocol, port and network**.
- **Protocol**: Dropdown and Select **TCP**.
- **Port or Port Range**: Type **3389**.
- **Network mask**: Type **0.0.0.0/0**.



- Select **OK**.

Note: In the **Protocol/ Port** section, you can see the new rule added for Port 3389.

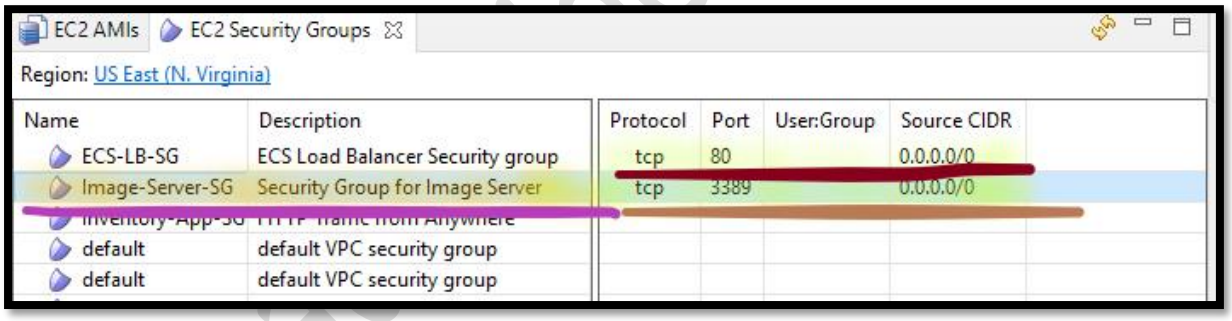
e. **From** the **Protocol/ Port** section:

i. **Right-Click** and ***Select*** **Add permissions**.

ii. **For** the ***Security Groups rule***:

- Select **Protocol, port and network**.
- **Protocol**: Dropdown and Select **TCP**.
- **Port or Port Range**: Type **80**.
- **Network mask**: Type **0.0.0.0/0**.

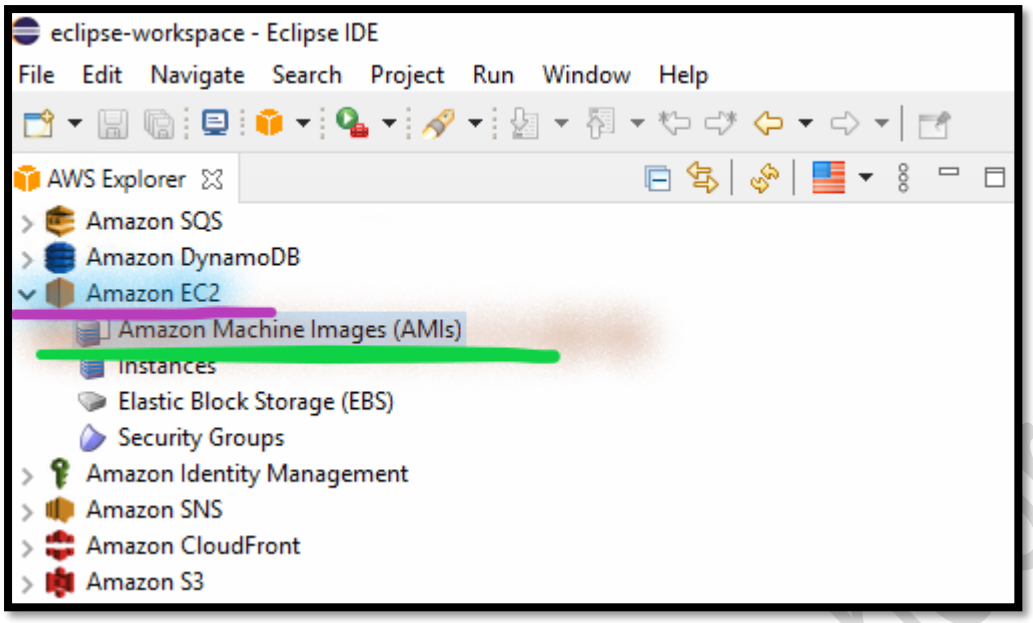
Note: In the **Protocol/ Port** section, you can see the two rule added for Port 3389 and 80.



12. **From** the **AWS Explorer**.

a. **Expand** **Amazon EC2**.

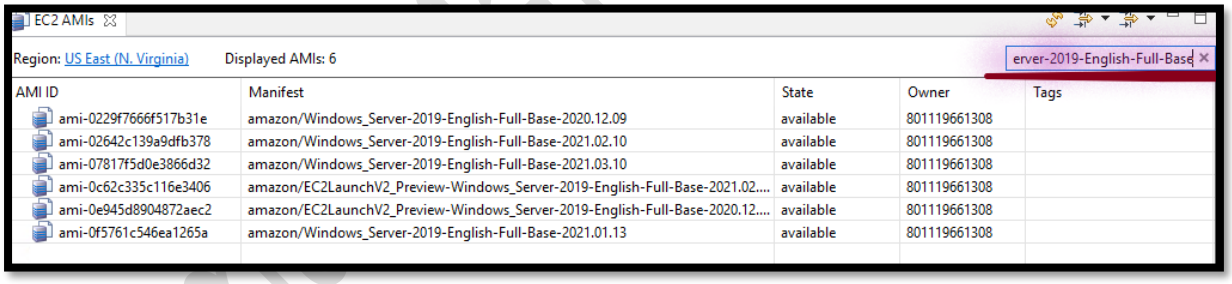
b. Click on **Amazon Machine Images (AMIs)**.



Note: New window gets open and display all the Images.

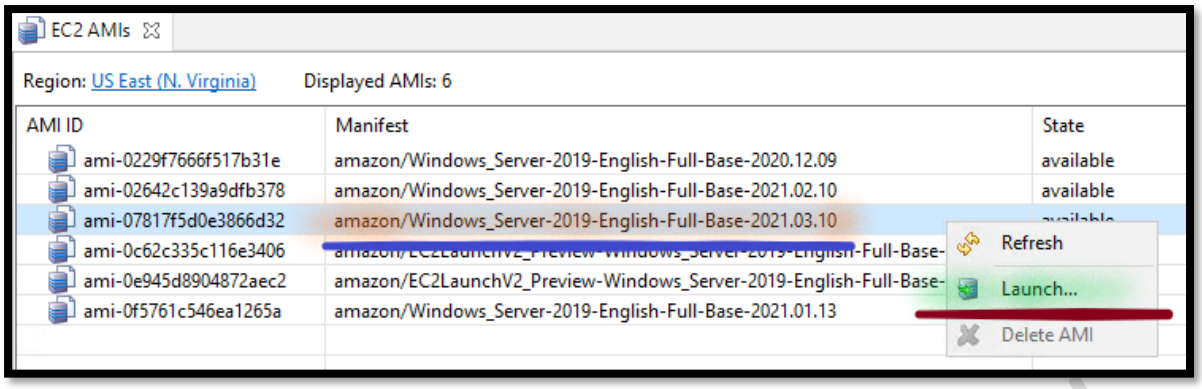
c. **From** the **EC2 AMIs**:

i. In the **Search**, type **Windows_Server-2019-English-Full-Base** and **Enter**.



ii. **Select** and **Right-Click** on the ***Windows_Server-2019-English-Full-Base*** with the ***latest version***.

iii. Select **Launch**.



Note: New window gets open and display the Options to Select to Laucnh Instance.

d. **From** the **Launch EC2 Instance** page:

i. **Instance Type**: Dropdown and Select **General Purpose Burstable Micro**.

ii. **Availability Zone**: Dropdown and Select **us-east-1a**.

iii. **Key Pair**: Select **My-Dev-LAB-KP**.

iv. **Security Group**: Select **Image-KP-SG**.

v. Select **Finish**.

13. **From** the **AWS Explorer**.

a. **Expand** **Amazon EC2**.

b. Click on **Instances**.

Note: You can see the new instance get launched. **Wait** till instance state should be **Running**.

Note: Go to the next task, But **Don't close the Dev Instance**.

Task 6: Connect to Web Server

In this task, you will log into the Image Web (Windows) Server that you just created from local desktop/ laptop.

Step 1: Update the Image Server Name

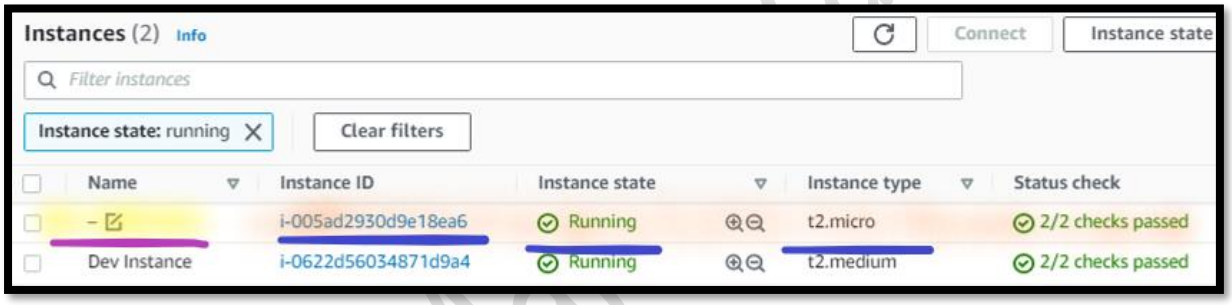
14. In the **AWS Management Console**, on the **Services** menu, click **EC2**.

15. Click **Instances**.

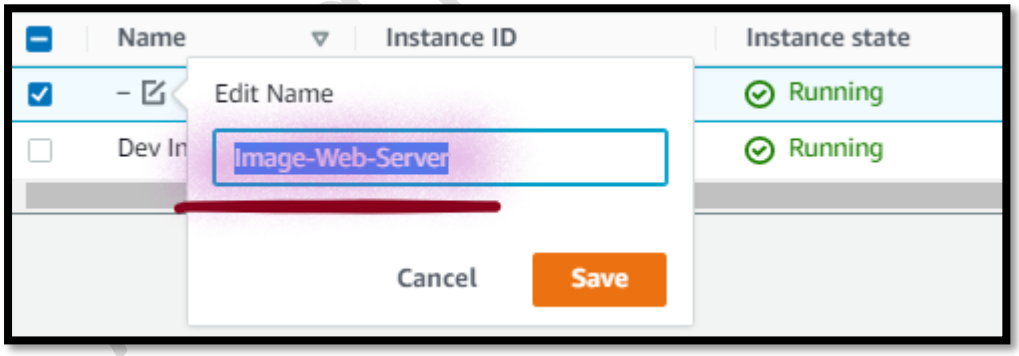
> **Note**: You can see the new instance in **Running state** without any defined Name.

a. **Hover** the ***mouse*** in the **name section** against the ***launched instance***.

b. Click on **Pencil icon**.



i. **Edit Name**: Type **Image Web Server**.



ii. Click on **Save**.

Step 2: Copy the Image Server Public IP address

16. In the **AWS Management Console**, on the **Services** menu, click **EC2**.

17. Click **Instances**.

18. Select **Image Web Server**.
    i. Go below and click on **Details**.
    ii. **Copy** the **Public IP address**.

Step 3: Generate Windows Password

19. To ***generate windows password***, select **Image Web Server** (windows) virtual machine.
    a. Select **Actions**.
    b. Select **Security**.
    c. Select **Get Windows Password**.
    d. **Browse**: Navigate and Select **My-Dev-LAB-KP**.pem key pair.
    e. Click on **Decrypt Password**.

Note: Windows will pop-up with **user name** and **password**.

Note: Copy the **user name** and **password** in **Notepad**.

    f. Select **Close**.

Step 4: Remote Desktop from Windows Desktop/ Laptop

Note: If you are using **Mac** Operating System, go below to follow the **Step 5**.

20. From the **local Desktop/ Laptop** (Windows), right click on **Start** & **Run**.
21. In the open, write **mstsc**, press **Ok**.
    a. **Type** the **Public IP Address** of the **Image Web Server** instance.
    b. Click **Connect**.
    c. **Type** the **Username** and **Password** of the **Image Web Server** instance and click **Ok**.

d. Click on **Yes** to confirm this connection, if prompted with the security message.

Note: Go to the **Task 4 (but don't close the Windows console)**.

Step 5: Remote Desktop from Mac Desktop/ Laptop

Note: If you are using **Windows** Operating System, go below to follow the **Step 4**.

22. **Download** and **Install** the Microsoft Remote Desktop client from the Mac App Store.

    https://apps.apple.com/us/app/microsoft-remote-desktop-8/id715768417

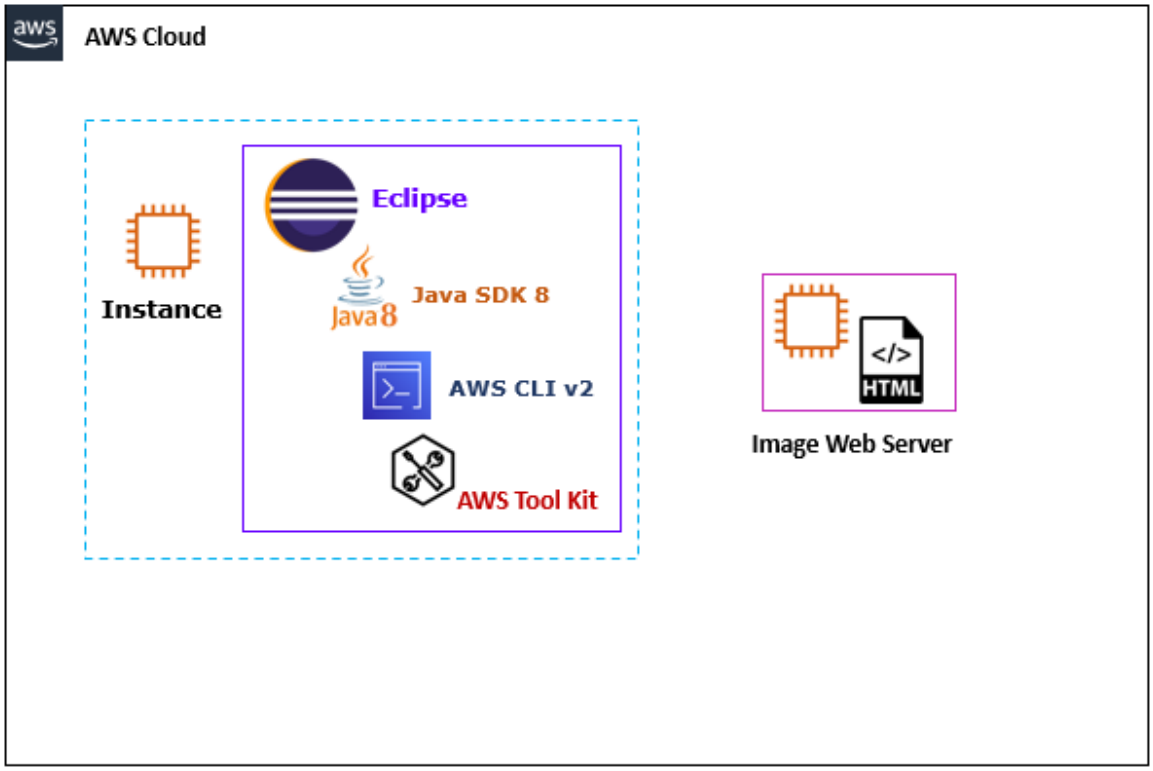
23. Open the **Remote Desktop client**.

    a. **Type** the **Username** and **Password** of the **Image Web Server** instance.

Note: Go to the next task **(but don't close the Windows console)**.

Task 7: Deploy the Application Code

In this task, you will deploy the application code into the Image Web (Windows) Server.

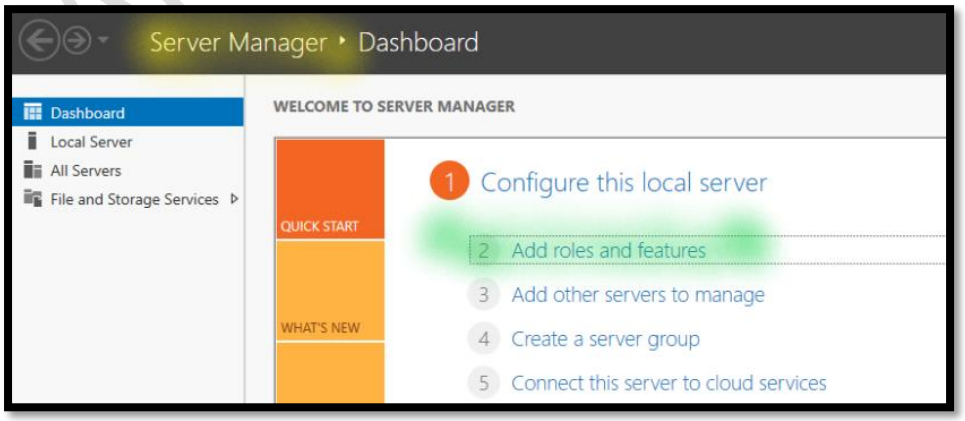


Step 1: Install Webserver (IIS) on Windows 2019 Virtual Machine

24. From the **Image Web Server** (Windows 2019), right click on **Start** & **Run**.

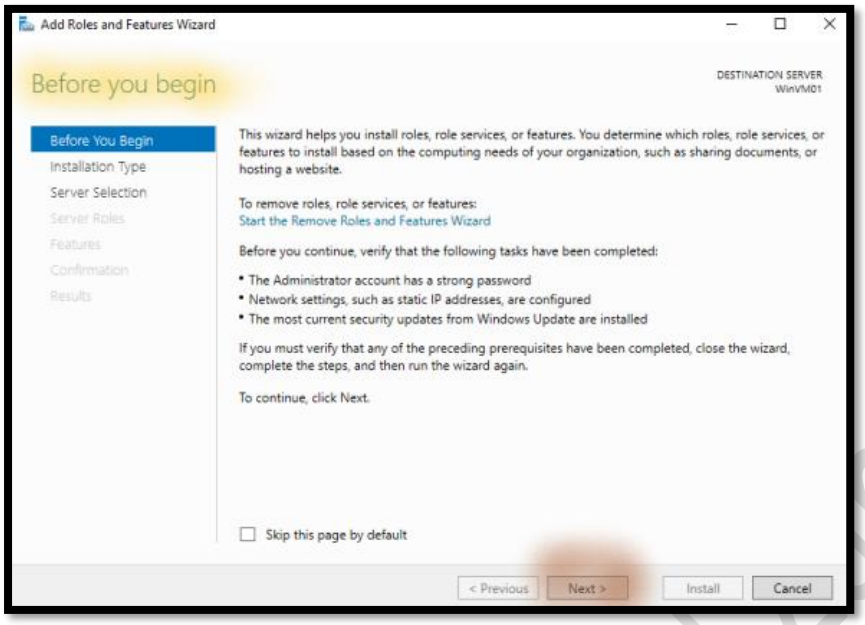
25. In the **Open**, type **servermanager.exe**, Press **Ok**.

26. Click on the **Add roles and features**.



a. In the **Before you begin** section:

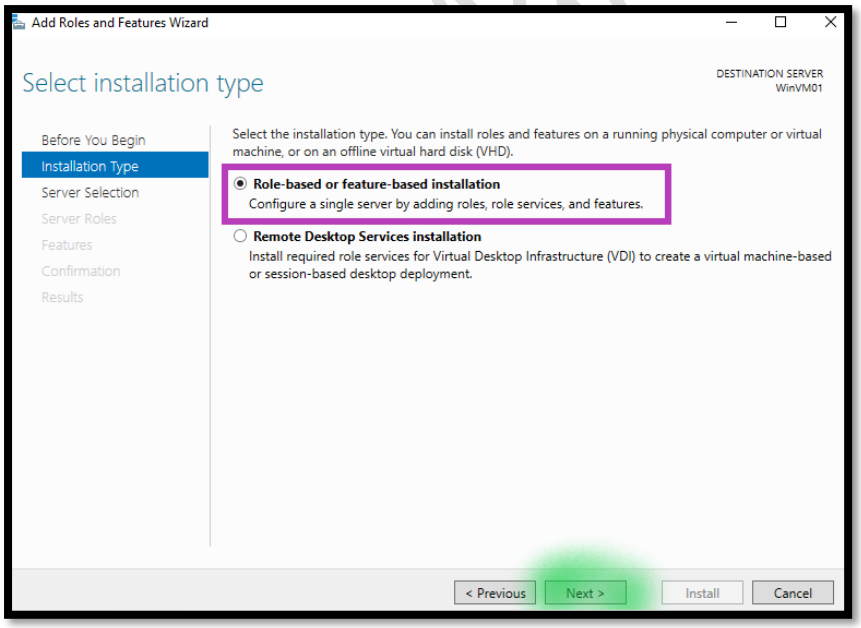
i. Click the **Next**.



b. In the **Select Installation type** section:

i. Select **Role-based or feature-based installation**.

ii. Click **Next**.



c. In the **Select destination server** section:

i. Select **Select a server from the server pool**.

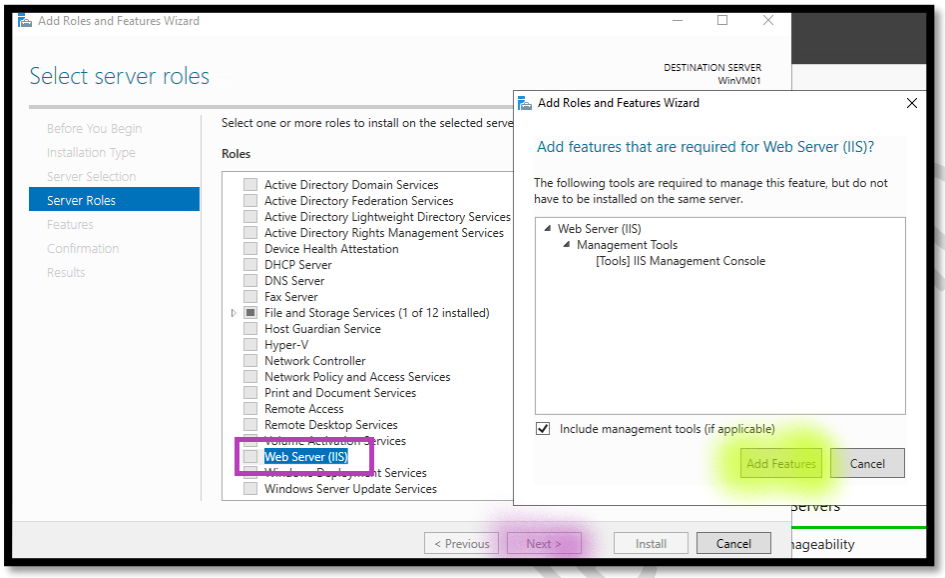
ii. Select **Next**.

d. In the **Select server roles** section:

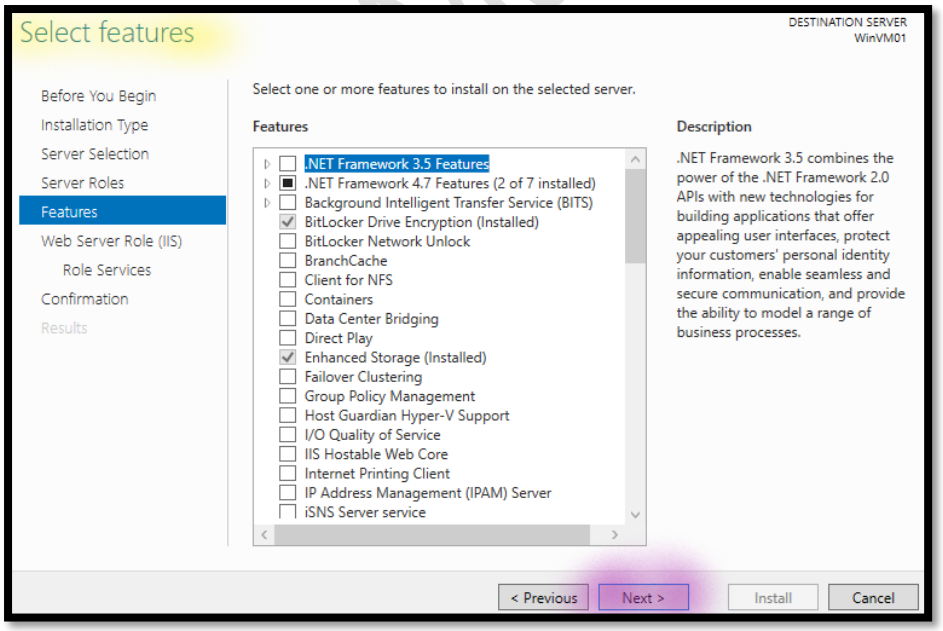
i. Select **Web server (IIS)**.

ii. In the **Add Roles and Features Wizard** window:

i. Select **Add features**.



iii. Select **Next**.



e. In the **Select feature** section:

i. Select **Next**.

f. In the **Web server role (IIS)** section:

i. Select **Next**.

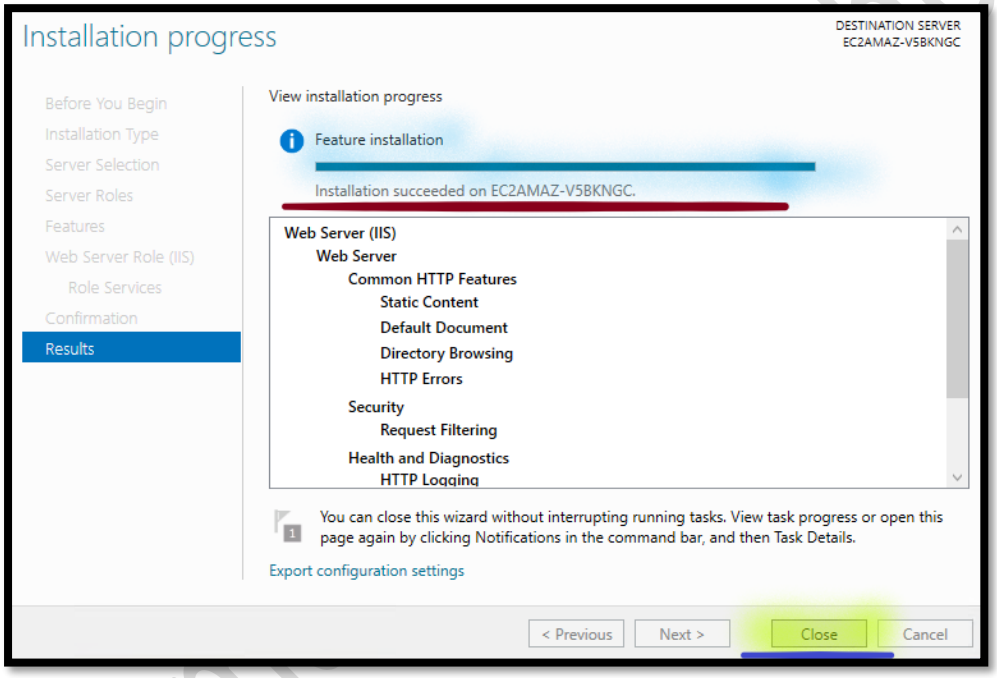
g. In the **Select role services** section:

i. Select **Next**.

h. In the **Confirm installation selections** section:

i. Click **Install**.

Note: **Wait** for installation completion.



i. Click **Close**.

Note: Close the **Server manager** also.

Step 2: Deploy Web Image Code

27. **Unzip** the **LAB-M04-02-HTML-Code.zip** (Image Gallery Code).

Note: **Lab-M04-02-HTML-Code**.zip (Image Gallery code) is available with the Lab Manual.

28. From the **Image Web Server** (Windows 2019), right click on **Start** & **Run**.

29. In the **Open**, write **c:\inetpub\wwwroot**, press **Ok**.

    a. **Copy** the image gallery code structure from local laptop/ desktop to the **wwwroot** folder.

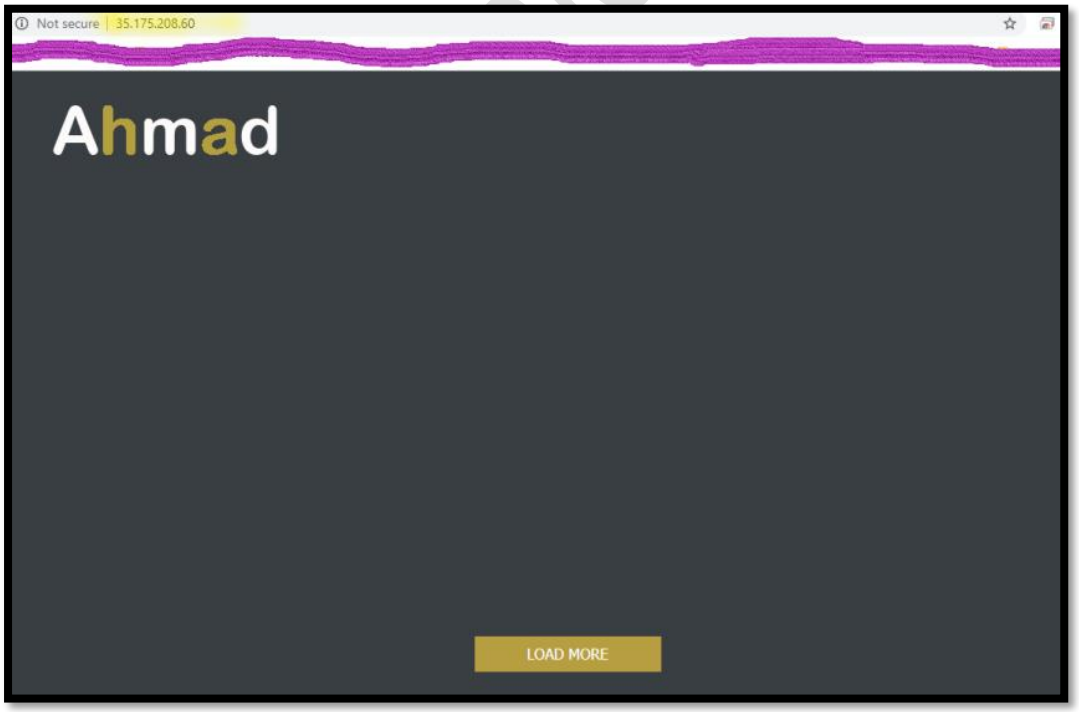
Note: You need to copy the code structure (folder and files), not the zip file.

Note: Go to the next task, But **Don't close the Image Web Server**.

Step 3: Access the Image Web Server

30. From the **Web browser**, type **Public IP Address** of the **Image Web Server** (Windows virtual machine) and access your **Image Web Server website**.

Note: You will see the Image Web Server web page.

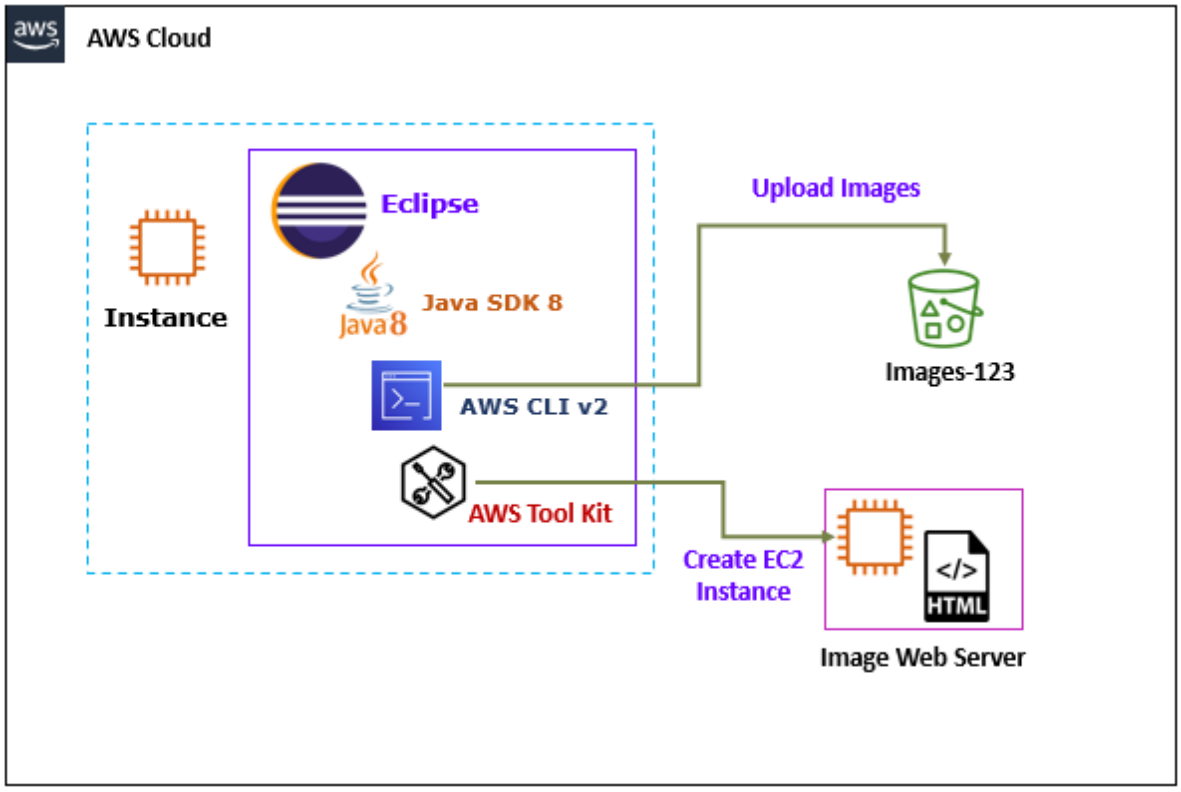


Note: Currently you will not see the blank web site without any Images displaying in the web page.

Note: Don't close the web site.

Task 8: Upload the Images to Bucket

In this task, you will upload the Images to the S3 bucket using AWS CLI.



Step 1: Copy the Images to the Dev Instance

31. **Return** to the **Dev Instance**.
32. **From** the **Dev Instance**, right click on **Start** & **Run**.
33. In the **Open**, write **c:**, press **Ok**.
    a. **Create** **ImagesGallery** folder in the **C drive**.
    b. **Open** the **ImagesGallery** folder.
    c. **Paste** the **Images** in the **ImagesGallery** folder.

Note: **Images-Gallery.zip** (JPG Images) is available with the Lab Manual.

Note: You need to copy all the **18 images** (.jpg files) not the zip file.

Step 2: Upload Images in the Bucket using AWS CLI

34. From the **Images Web Server** virtual machine, Go to **Start** menu, right click on **Start** & **Run**.

    a. **From** the **Command Line Interpreter**, **Run** the below command to ***List S3 objects***.
    aws s3 ls

Note: You can see your **images-123** bucket.

    b. **From** the **Command Line Interpreter**, **Run** the ***below command*** to list the bucket objects.
    aws s3 ls s3://**images-123**

Note: **Replace Images-123** with your bucket name.

Note: You can see two files, which you have uploaded via JAVA.

    c. **From** the **Command Line Interpreter**, **Run** the ***below command*** to change to source directory where Images Gallery folder are stored.
    cd c:\imagesgallery

    d. **From** the **Command Line Interpreter**, **Run** the ***below command*** to list the Images.
    dir

Note: You can see all your 18 images.

e. **From** the **Command Line Interpreter**, **Run** the ***below command*** to sync the Images Gallery contents to images-123 s3 bucket and set the public read access permissions for files copied to Amazon S3.
aws s3 sync . s3://**images-123** --acl public-read

Note: **Replace Images-123** with your bucket name.

Note:You can see the **upload** message against each images in the Output.

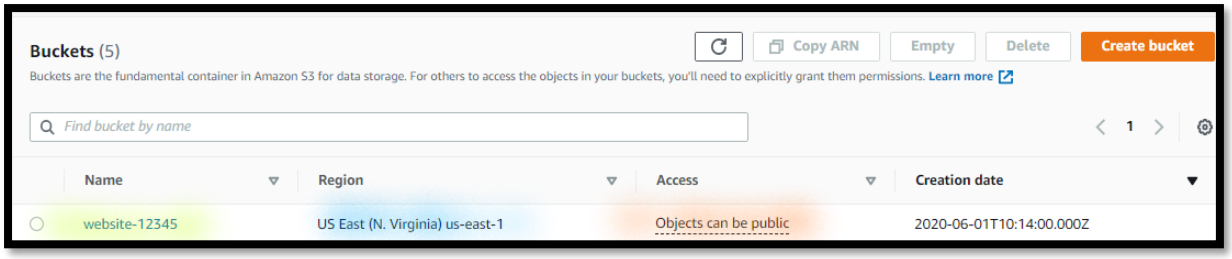
```
C:\inetpub\wwwroot\images-gallery-S3>aws s3 sync . s3://images-789
upload: .\12.jpg to s3://images-789/12.jpg
upload: .\10.jpg to s3://images-789/10.jpg
upload: .\1.jpg to s3://images-789/1.jpg
upload: .\16.jpg to s3://images-789/16.jpg
upload: .\4.jpg to s3://images-789/4.jpg
upload: .\18.jpg to s3://images-789/18.jpg
upload: .\2.jpg to s3://images-789/2.jpg
upload: .\17.jpg to s3://images-789/17.jpg
upload: .\6.jpg to s3://images-789/6.jpg
upload: .\3.jpg to s3://images-789/3.jpg
upload: .\5.jpg to s3://images-789/5.jpg
upload: .\11.jpg to s3://images-789/11.jpg
upload: .\9.jpg to s3://images-789/9.jpg
upload: .\7.jpg to s3://images-789/7.jpg
upload: .\15.jpg to s3://images-789/15.jpg
upload: .\14.jpg to s3://images-789/14.jpg
upload: .\8.jpg to s3://images-789/8.jpg
upload: .\13.jpg to s3://images-789/13.jpg
```

Step 3: View the Bucket

35. In the **AWS Management Console**, on the **Services** menu, click **S3**.

36. Click the **Buckets** tab.

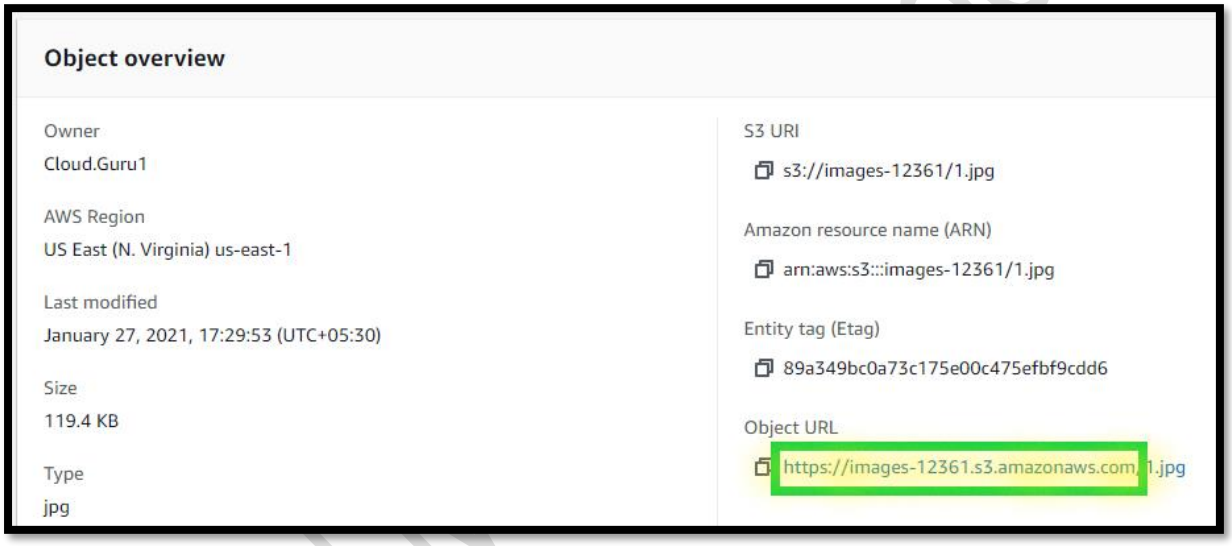
37. Open **images-123** bucket.



Step 4: Copy the Images Object URL

38. In the **AWS Management Console**, on the **Services** menu, click **S3**.
39. Click the **Buckets** tab.
    a. Open **images-123** bucket.
    b. Select **Objects** and Open **1.jpg** image.
40. **Copy** the **Object URL** in the **Notepad**.

Note: **Copy** the Object URL upto ***....s3.amazonaws.com*** only.



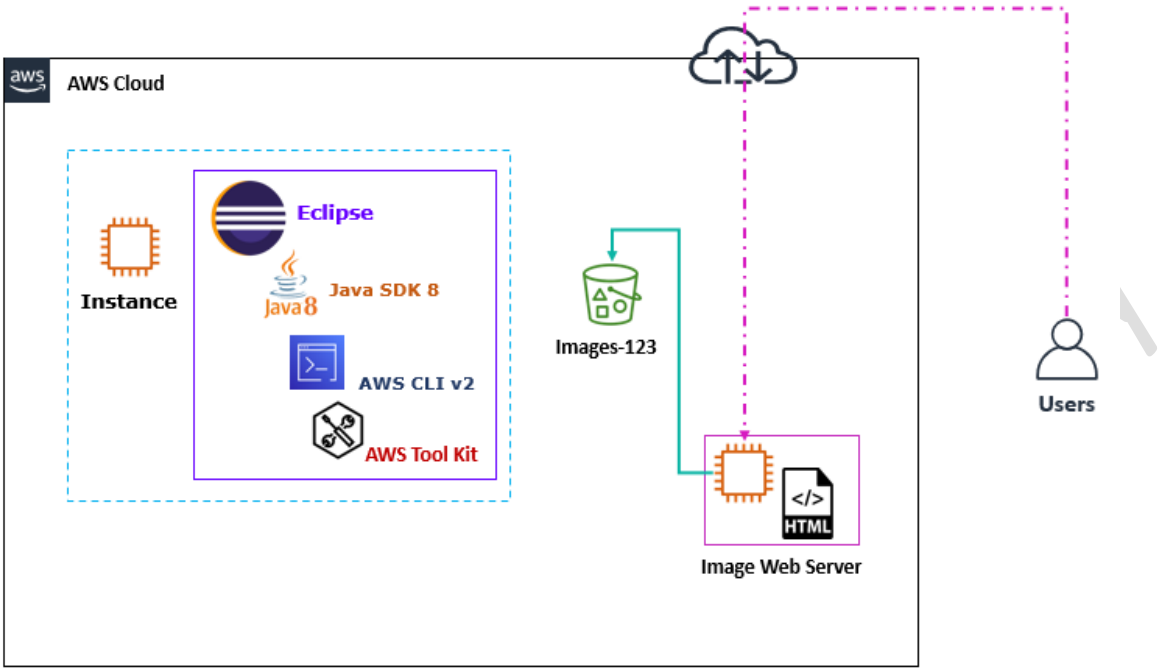
Task 9: Update the Images Gallery Code to Pull the Images from S3 Bucket

Step 1: Update the Code to display the Images from the S3 Bucket

41. **Return** to the **Images Web Server**.
42. **From** the **Images Web Server**, right click on **Start** & **Run**.
43. In the **Open**, write **c:\inetpub\wwwroot**, press **Ok**.
    a. **Open** the **index.html** in the **Notepad**.
        i. **Replace** ***all the*** **TO DO** with the **S3 bucket Object URL** which you have copied in the previous step.

Task 10: Access the Images Gallery Application

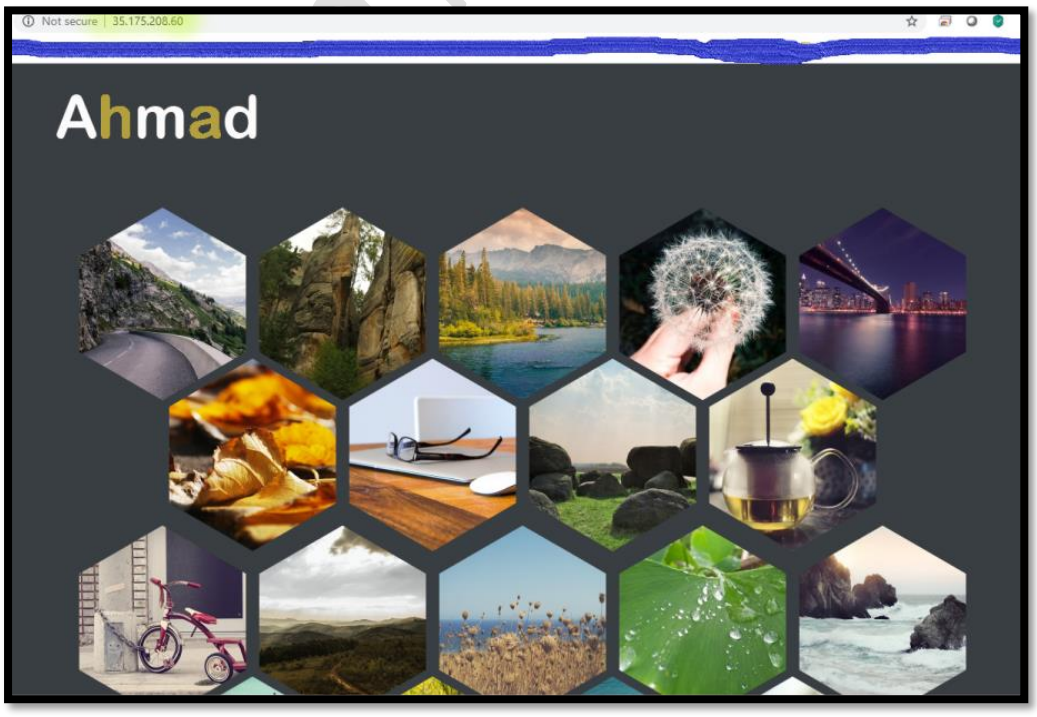
In this task, you will access your deployment.



Step 1: Access the Image Web Server

44. **Return** to the **Web browser** and **Refresh** the web browser.

Note: You will see the web image web page.



Task 11: Delete the Environment

Step 1: Terminate EC2 Instances

45. In the **AWS Management Console**, on the **Services** menu, click **EC2**.
46. Click **Instances**.
47. Select **Images Web Server**.
    i. Click on **Instance state**.
    ii. Select **Terminate instance**.
    iii. Select **Terminate**.
48. Select **Dev Instance**.
    iv. Click on **Instance state**.
    v. Select **Terminate instance**.
    vi. Select **Terminate**.

Step 2: Delete the Images-123 bucket

49. In the **AWS Management Console**, on the **Services** menu, click **S3**.
50. Click the **Buckets** tab.
51. Select **images-123** bucket.
    a. Select **Empty**.
    b. **Type permanently delete** to delete all the objects.
    c. Select **Empty**.
    d. Select **Exit**.
52. Select **images-123** bucket.
    a. Select **Delete**.
    b. **Type images-123** bucket name to delete bucket.
53. Select **Delete bucket**.