

ASSIGNMENT 2

Name: Nguyen Gia Binh

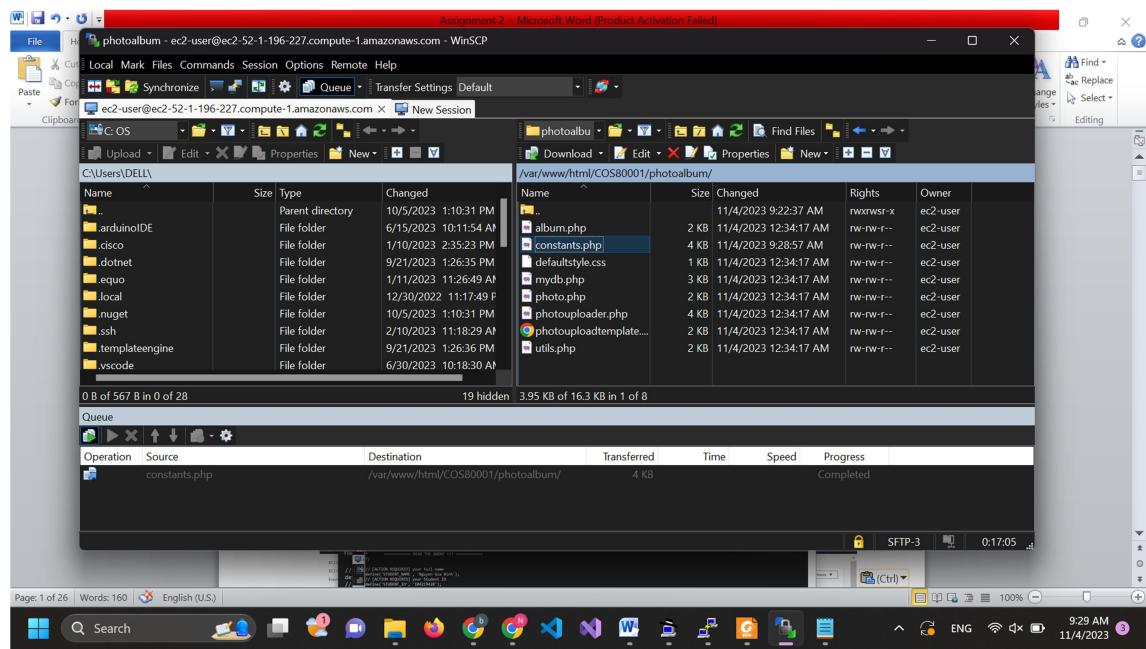
StudentID: 104219428

Tutorial time: Saturday 10:00AM

Date of Submission: 04/11/2023

Task 1: Functional requirements of Photo Album website

1.1: Modify constant.php

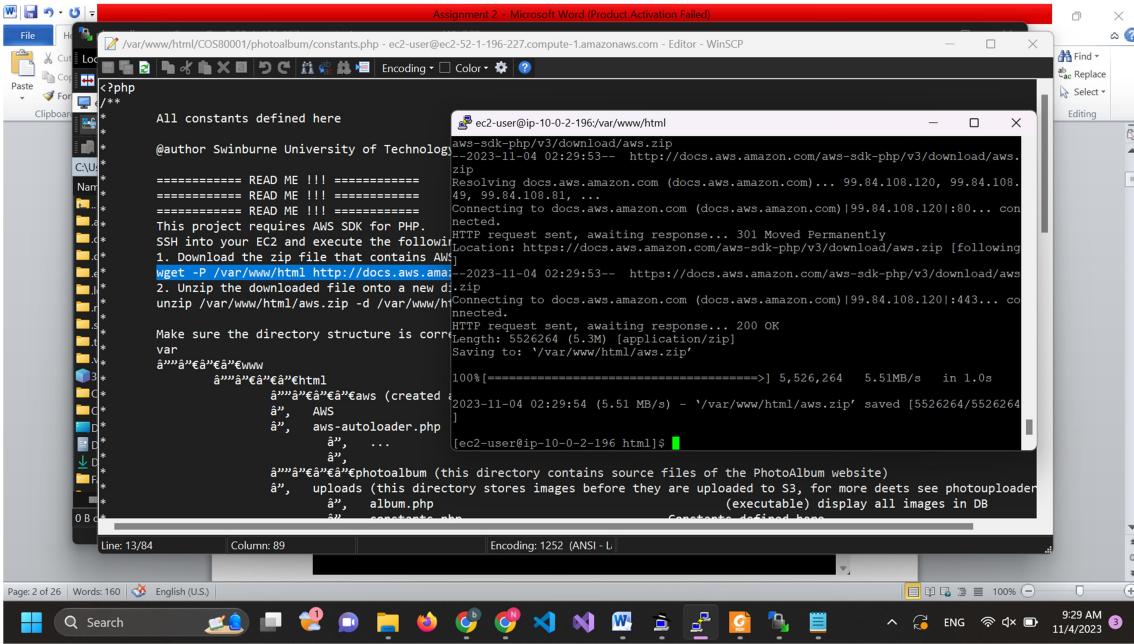


```

Launch AWS Academy.Learner < Instance details | EC2 | us-east-1 < RDS | us-east-1 < New Tab < 
----- READ THE ABOVE !!! -----
File Encoding Color Options 
aws 
EC2 Events 
Instance Details 
Name: Nguyen Gia Binh 
// [ACTION REQUIRED] your full name 
define('STUDENT_NAME', 'Nguyen Gia Binh'); 
// [ACTION REQUIRED] your student ID 
define('STUDENT_ID', '104219428'); 
// [ACTION REQUIRED] your tutorial session 
define('TUTORIAL_SESSION', 'Saturday 12:00AM'); 
// [ACTION REQUIRED] name of the S3 bucket that stores images 
define('BUCKET_NAME', 'asmgphoto'); 
// [ACTION REQUIRED] region of the above bucket 
define('REGION', 'us-east-1'); 
define('S3_BASE_URL', 'https://'.BUCKET_NAME.'.s3.amazonaws.com/'); 
// [ACTION REQUIRED] name of the database that stores photo meta-data (note that this is not the DB identifier of the RDS instance) 
define('DB_NAME', 'photo'); 
// [ACTION REQUIRED] endpoint of RDS instance 
define('DB_ENDPOINT', 'assignment1b-db.conqlubleng.us-east-1.rds.amazonaws.com'); 
// [ACTION REQUIRED] username of your RDS instance 
define('DB_USER', 'student'); 
// [ACTION REQUIRED] password of your RDS instance 
define('DB_PWD', 'luckyw707'); 
// [ACTION REQUIRED] name of the DB table that stores photo's meta-data 
define('DB_PHOTO_TABLE_NAME', 'photo'); 
// The table above has 5 columns: 
// [ACTION REQUIRED] name of column in the above table that stores photo's titles 
define('DB_PHOTO_TITLE_COL_NAME', 'title'); 
// [ACTION REQUIRED] name of the column in the above table that stores photo's descriptions 
define('DB_PHOTO_DESCRIPTION_COL_NAME', 'description'); 
// [ACTION REQUIRED] name of column in the above table that stores photo's creation date 
define('DB_PHOTO_CREATED_DATE_COL_NAME', 'date'); 
// [ACTION REQUIRED] name of the column in the above table that stores photo's keywords 
define('DB_PHOTO_KEYWORDS_COL_NAME', 'keywords'); 
// [ACTION REQUIRED] name of the column in the above table that stores photo's links in S3 
define('DB_PHOTO_S3REFERENCE_COL_NAME', 'reference'); 
// [ACTION REQUIRED] name (can also be used) of the Lambda function that is used to create thumbnails 
define('LAMBDA_FUNCTION_NAME', 'CreateThumbnail1'); 
----- 
Line: 35/84 Column: 89 Character: 115 (0x73) Encoding: 1252 (ANSI - L Modified 
----- 
Key Pair: Disabled 
Network Interface: 
Security Group: 
Placement Group: 
CloudWatch Feedback 
----- 
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9:28 AM 11/4/2023 

```

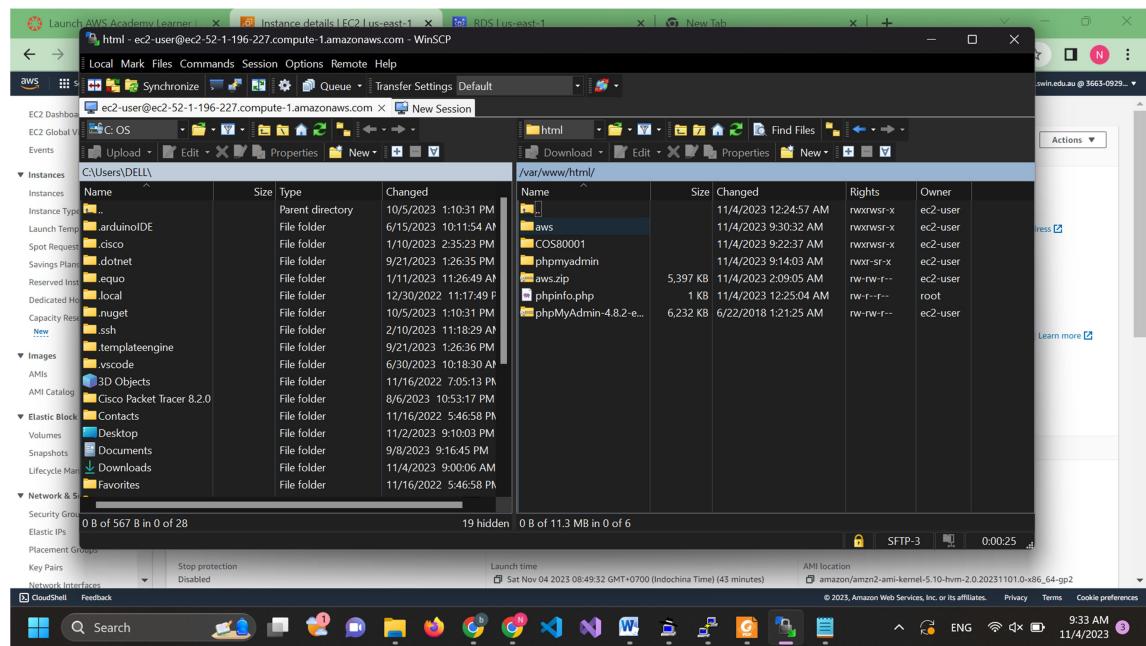
1.2: Download the zip file that contain AWS SDK PHP and unzip it



The screenshot shows a WinSCP interface with a terminal window open. The terminal window title is "Assignment 2 - Microsoft Word (Product Activation Failed)". The command being run is "wget -P /var/www/html http://docs.aws.amazon.com/aws-sdk-php/v3/download/aws.zip". The output shows the download progress: "2023-11-04 02:29:53-- https://docs.aws.amazon.com/aws-sdk-php/v3/download/aws.zip", "HTTP request sent, awaiting response... 301 Moved Permanently", "Location: https://docs.aws.amazon.com/aws-sdk-php/v3/download/aws.zip [following]", "HTTP request sent, awaiting response... 200 OK", "Length: 5526264 (5.3M) [application/zip]", "Saving to: '/var/www/html/aws.zip'", "100%[=====]> 5,526,264 5.51MB/s in 1.0s". The file is saved as "5526264/5526264". The terminal prompt "[ec2-user@ip-10-0-2-196 html]\$" is visible at the bottom.

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The screenshot shows a Microsoft Word document titled "Assignment 2 - Microsoft Word [Product Activation Failed]". The document contains PHP code related to a PhotoAlbum project. A terminal window titled "ec2-user@ip-10-0-2-196:~" is open, displaying the same PHP code. The terminal also shows the output of running the code, which includes various AWS SDK for PHP classes and their implementations. The status bar at the bottom of the terminal window indicates "Encoding: 1252 (ANSI - L)". The taskbar at the bottom of the screen shows various icons for common applications like File Explorer, Task Manager, and browser.



Task 2:

2.1: Create a VPC and NAT Gateway

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Screenshot of the AWS VPC Create VPC console showing the configuration of a new VPC.

VPC settings

- Resources to create:** VPC only (selected)
- Name tag auto-generation:** Auto-generate (selected), Name tag: BNguenA2VPC
- IPv4 CIDR block:** 10.0.0.0/16 (65,536 IPs)
- IPv6 CIDR block:** No IPv6 CIDR block (selected)
- Tenancy:** Default
- Number of Availability Zones (AZs):** 2 (selected)

Preview

Customize AZs

- First availability zone:** us-east-1a
- Second availability zone:** us-east-1b

Number of public subnets: 2 (selected)

Number of private subnets: 4 (selected)

Customize subnets CIDR blocks:

- Public subnet CIDR block in us-east-1a: 10.0.1.0/24 (256 IPs)
- Public subnet CIDR block in us-east-1b: 10.0.2.0/24 (256 IPs)
- Private subnet CIDR block in us-east-1a: 10.0.3.0/24 (256 IPs)
- Private subnet CIDR block in us-east-1b: 10.0.4.0/24 (256 IPs)

NAT gateways (\$): None (selected)

VPC endpoints: Endpoints can be added using NAT instance endpoints and Amazon services.

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The screenshot shows the AWS VPC console interface for creating a new VPC. The VPC is named BNguyenA2VPC-vpc. The configuration includes:

- Subnets (4):** BNguyenA2VPC-subnet-public1-us-east-1a, BNguyenA2VPC-subnet-private1-us-east-1a, BNguyenA2VPC-subnet-public2-us-east-1b, BNguyenA2VPC-subnet-private2-us-east-1b.
- Route tables (3):** BNguyenA2VPC-rtb-public, BNguyenA2VPC-rtb-private1-us-east-1a, BNguyenA2VPC-rtb-private2-us-east-1b.
- Network connections (3):** BNguyenA2VPC-igw, BNguyenA2VPC-nat-public1-us-east-1a, BNguyenA2VPC-vpc-s3.

Other settings include:

- Public subnet CIDR block in us-east-1a:** 10.0.1.0/24 (256 IPs)
- Public subnet CIDR block in us-east-1b:** 10.0.2.0/24 (256 IPs)
- Private subnet CIDR block in us-east-1a:** 10.0.3.0/24 (256 IPs)
- Private subnet CIDR block in us-east-1b:** 10.0.4.0/24 (256 IPs)
- NAT gateways (1) Info:** Choose the number of Availability Zones (AZs) in which to create NAT gateways. Note that there is a charge for each NAT gateway. (1 per AZ)
- VPC endpoints Info:** Endpoints can help reduce NAT gateway charges and improve security by accessing S3 directly from the VPC. By default, full access policy is used. You can customize this policy at any time. (None, S3 Gateway)
- DNS options Info:** Enable DNS hostnames and Enable DNS resolution.
- Additional tags:** None

At the bottom, there are "Cancel" and "Create VPC" buttons.

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Screenshot of the AWS VPC Console showing the 'Create VPC workflow' and 'VPC Details' pages.

Create VPC workflow:

- Success
- Details
- Subnets
- Route tables
- Internet gateways
- Egress-only internet gateways
- Carrier gateways
- DHCP option sets
- Elastic IPs
- Managed prefix lists
- Endpoints
- Endpoint services
- NAT gateways
- Peering connections
- Security
- Network ACLs
- Security groups
- DNS firewall
- Rule groups
- Domain lists
- Network Firewall
- Firewalls

VPC Details:

Details	
VPC ID	vpc-0995ac76487dabcc6
State	Available
Tenancy	Default
Default VPC	No
Network Address Usage metrics	Disabled
IPv4 CIDR	10.0.0.0/16
Route 53 Resolver DNS Firewall rule groups	Failed to load rule groups
DNS hostnames	Enabled
Main route table	rtb-0051a60634b6f8706
IPv6 pool	-
Owner ID	366509293917
DNS resolution	Enabled
Main network ACL	act-01455ee557af8779c
IPv6 CIDR (Network border group)	-

Resource map:

```

graph LR
    VPC[VPC] --- Subnets[Subnets]
    Subnets --- us_east_1a[us-east-1a]
    Subnets --- us_east_1b[us-east-1b]
    us_east_1a --- BN1[BNguyenA2VPC-subnet-public1-us-east-1a]
    us_east_1a --- BN2[BNguyenA2VPC-subnet-private1-us-east-1a]
    us_east_1b --- BN3[BNguyenA2VPC-subnet-public2-us-east-1b]
    us_east_1b --- BN4[BNguyenA2VPC-subnet-private2-us-east-1b]
    RT[Route tables] --- RT1[BNguyenA2VPC-rtb-private1-us-east-1a]
    RT1 --- RT2[BNguyenA2VPC-rtb-public]
    RT1 --- RT3[rtb-0031a60634b6f8706]
    RT1 --- RT4[BNguyenA2VPC-rtb-private2-us-east-1b]
    NC[Network connections] --- NC1[BNguyenA2VPC-igw]
    NC --- NC2[BNguyenA2VPC-nat-public1-us-east-1a]
    NC --- NC3[BNguyenA2VPC-vpce-s3]
  
```

2.2: S3 bucket (re-use the one from asm1b)

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The screenshot shows the AWS S3 console with the 'asm1bphoto' bucket selected. The bucket is publicly accessible. The 'Objects' section lists 8 items:

Name	Type	Last modified	Size	Storage class
album.php	php	October 14, 2023, 12:18:01 (UTC+07:00)	1.0 KB	Standard
constants.php	php	October 14, 2023, 12:18:00 (UTC+07:00)	2.9 KB	Standard
dark-cosmic-jhin-splash-art-lol-4K-87.jpg	jpg	October 14, 2023, 11:57:06 (UTC+07:00)	250.7 KB	Standard
defaultstyle.css	css	October 14, 2023, 12:18:02 (UTC+07:00)	388.0 B	Standard
jhin-dark-comic-lol-art-0-hd-wallpaper-1920x1080-uhdpaper.com-390.0_a.jpg	jpg	October 14, 2023, 11:57:08 (UTC+07:00)	399.7 KB	Standard
jhin-emperors-lol-hd-wallpaper-uhdpaper.com-245@16j.jpg	jpg	October 14, 2023, 11:57:10 (UTC+07:00)	513.5 KB	Standard
mydb.php	php	October 14, 2023, 12:18:03 (UTC+07:00)	1.2 KB	Standard
photo.php	php	October 14, 2023, 12:18:04 (UTC+07:00)	1.2 KB	Standard

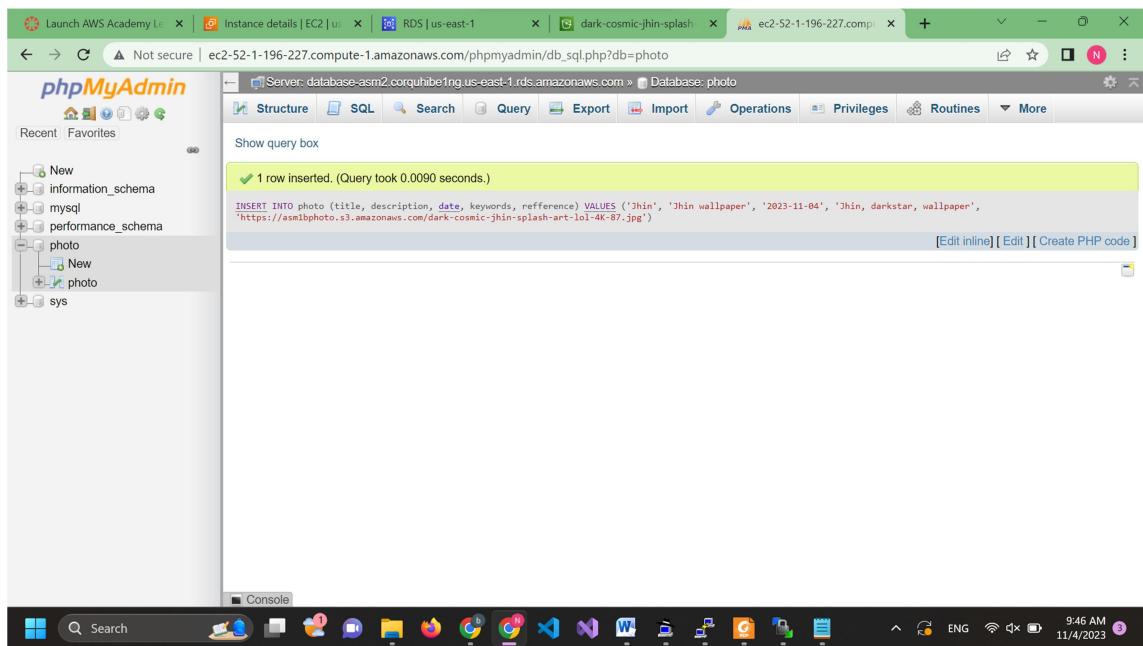
Put the photo into your RDS database using the object URL and SQL

<https://asm1bphoto.s3.amazonaws.com/dark-cosmic-jhin-splash-art-lol-4K-87.jpg>

The screenshot shows the phpMyAdmin interface connected to an RDS database named 'photo'. The 'Structure' tab is selected. In the SQL tab, a query is being run:

```
1 INSERT INTO photo (title, description, date, keywords, refference)
2 VALUES ('Jhin', 'Jhin wallpaper', '2023-11-04', 'Jhin, darkstar, wallpaper', 'https://asm1bphoto.s3.amazonaws.com/dark-cosmic-jhin-splash-art-lol-4K-87.jpg')
```

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2.2.1: Change bucket policy to restricts access to a specific HTTP referrer

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The screenshot shows the AWS S3 Bucket Policy editor. The policy is defined as follows:

```
{
  "Version": "2012-10-17",
  "Id": "HTTP referer policy example",
  "Statement": [
    {
      "Sid": "Allow only GET requests originating from www.example.com and example.com",
      "Effect": "Allow",
      "Principal": "*",
      "Action": [
        "s3:GetObject",
        "s3:GetObjectVersion"
      ],
      "Resource": "arn:aws:s3:::asm1bphphoto/*",
      "Condition": {
        "StringLike": {
          "aws:Referer": [
            "http://www.example.com/*",
            "http://example.com/*"
          ]
        }
      }
    }
  ]
}
```

Object Ownership: Info

Control ownership of objects written to this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership determines who can specify access to objects.

Object Ownership
Bucket owner enforced
ACLs are disabled. All objects in this bucket are owned by this account. Access to this bucket and its objects is specified using only policies.

CloudShell Feedback

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2.2.2: Tetsing photo resize

The screenshot shows the AWS S3 Objects list. There are 13 objects listed:

Name	Type	Last modified	Size	Storage class
photo.php	php	November 4, 2023, 10:02:54 (UTC+07:00)	1.2 KB	Standard
photouploader.php	php	November 4, 2023, 10:02:55 (UTC+07:00)	4.0 KB	Standard
photouploadtemplate.html	html	November 4, 2023, 10:02:56 (UTC+07:00)	1.4 KB	Standard
resized-jhin-dark-cosmic-lol-art-0-hd-wallpaper-1920x1080-uhdpaper.com-390.0_a.jpg	jpg	November 4, 2023, 11:15:12 (UTC+07:00)	52.2 KB	Standard
resized-jhin-empyrean-lol-hd-wallpaper-uhdpaper.com-245@1.jpg	jpg	November 4, 2023, 11:18:30 (UTC+07:00)	72.5 KB	Standard
utils.php	php	November 4, 2023, 10:02:57 (UTC+07:00)	1.7 KB	Standard

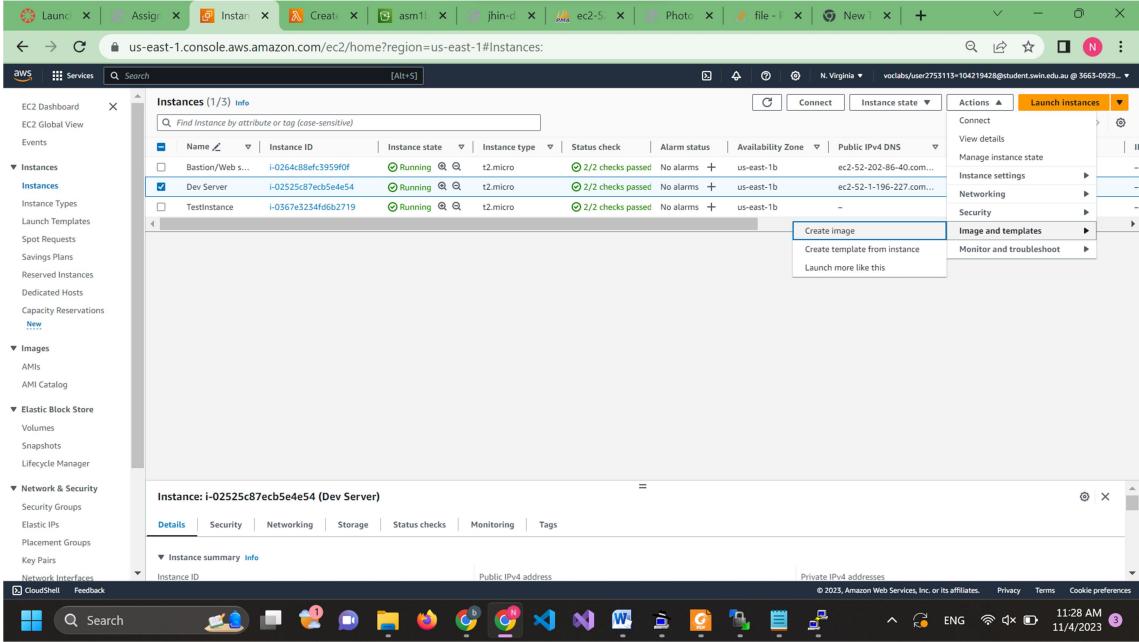
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2.3: Load balancer

2.3.1:Create custom AMI

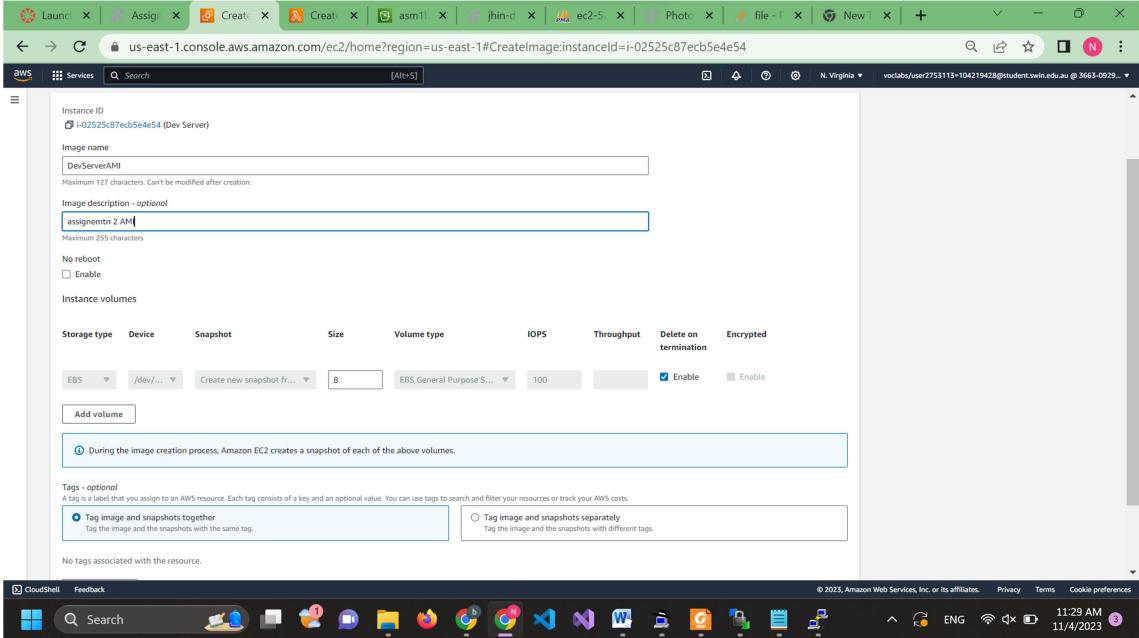
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The screenshot shows the AWS EC2 Instances page. There are three instances listed:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
Bastion/Web s...	i-0264c88efc3959f0f	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b	ec2-52-202-86-40.com...
Dev Server	i-02525c87ecb5e4e54	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b	ec2-52-1-196-227.com...
TestInstance	i-0367e3234fd6b2719	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b	-

A context menu is open over the second instance (Dev Server). The 'Create image' option is highlighted.



The screenshot shows the 'Create image' dialog for the instance i-02525c87ecb5e4e54 (Dev Server). The form fields are:

- Image name: DevServerAMI
- Image description (optional): assignment 2 AMI
- No reboot: Enable
- Instance volumes:
 - Storage type: EBS
 - Device: /dev/...
 - Snapshot: Create new snapshot from...
 - Size: 8
 - Volume type: EBS General Purpose S...
 - IOPS: 100
 - Throughput: Enable
 - Delete on termination: Enable
 - Encrypted: Enable
- Add volume:
- Tags (optional):
 - Tag image and snapshots together: Tag the image and the snapshots with the same tag.
 - Tag image and snapshots separately: Tag the image and the snapshots with different tags.
- No tags associated with the resource.

2.3.3: Create target group

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The screenshot shows the AWS CloudShell interface with two browser windows open:

- Top Window:** A screenshot of the AWS Management Console showing the "Create Image" page for an EC2 instance. The instance ID is i-02525c87ecb5e4e54 (Dev Server). The image name is DevServerAMI, and the image description is "assignment 2 AMI". The storage type is EBS, with one volume of 8 GB and IOPS 100. The throughput is 100. The delete on termination checkbox is checked. The encrypted checkbox is unchecked. A note says "During the image creation process, Amazon EC2 creates a snapshot of each of the above volumes." Under "Tags - optional", there are two options: "Tag image and snapshots together" (selected) and "Tag image and snapshots separately". No tags are associated with the resource.
- Bottom Window:** A screenshot of the AWS Management Console showing the "Create Target Group" page. The target group name is "TargetgroupA2". The protocol is set to HTTP with port 80. The IP address type is IPv4, selected. The VPC dropdown shows "BNguyenAV2PC-vpc" with "vpc-0995a764d7dabcc6" and "IPv4: 10.0.0.0/16". The protocol version is set to HTTP1. The health checks section is partially visible at the bottom.

Target group name is: TargetgroupA2

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The screenshot shows a Windows desktop environment with the AWS CloudShell interface open. Two browser windows are visible, both titled "us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateTargetGroup".

Top Browser Window (Step 1):

- Protocol:** gRPC (radio button selected)
- Health checks:**
 - Protocol: HTTP
 - Path: /photogallery_album.php
- Attributes:** A note states: "Certain default attributes will be applied to your target group. You can view and edit them after creating the target group."
- Tags - optional:** A note states: "Consider adding tags to your target group. Tags enable you to categorize your AWS resources so you can more easily manage them."

Bottom Browser Window (Step 2):

- Step 1: Specify group details**
- Step 2: Register targets**
- Available instances (1):**

Instance ID	Name	State	Security groups	Zone	Private IPv4 address
i-02525c87ecb5e454	Dev Server	Running	DevServerSG_A2	us-east-1b	10.0.2.196

Ports for the selected instances:
80
1-65535 (separate multiple ports with commas)

- Review targets:**

Targets (0)
<input type="button" value="Remove all pending"/>

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2.3.4: Create load balancer

The screenshot shows the AWS CloudShell interface with multiple tabs open. The active tab is titled "Create Application Load Balancer".

Basic configuration:

- Load balancer name:** ELBaz2
- Scheme:** Internet-facing (selected)
- IP address type:** IPv4 (selected)

Network mapping:

- VPC:** BNguyenA2VPC-vpc-0995ac7c9487abcc6
- Mappings:**
 - us-east-1a (use1-az2):** Subnet: subnet-0eb4bd8c125b74f869 (BNguyenA2VPC-subnet-private1-us-east-1a) - A warning message states: "The selected subnet does not have a route to an internet gateway. This means that your load balancer will not receive internet traffic. You can proceed with this selection; however, for internet traffic to reach your load balancer, you must update the subnet's route table in the VPC console."
 - us-east-1b (use1-az4):** Subnet: subnet-03c95b3875f85957a (BNguyenA2VPC-subnet-private2-us-east-1b) - A warning message states: "The selected subnet does not have a route to an internet gateway. This means that your load balancer will not receive internet traffic. You can proceed with this selection; however, for internet traffic to reach your load balancer, you must update the subnet's route table in the VPC console."

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Security groups [Info](#)
A security group is a set of firewall rules that control the traffic to your load balancer. Select an existing security group, or you can [create a new security group](#).

Listeners and routing [Info](#)
A listener is a process that checks for connection requests using the port and protocol you configure. The rules that you define for a listener determine how the load balancer routes requests to its registered targets.

Protocol Port Default action [Info](#)

HTTP	: 80	Forward to	TargetgroupA2
1-65535		Target type:	Instance, IPv4

[Create target group](#)

Listener tags - optional
Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.

Add listener tag
You can add up to 50 more tags.

Add listener

EC2 > Load balancers

Load balancers (1)

Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.

Name	DNS name	State	VPC ID	Availability Zones	Type	Date created
ELBa2	ELBa2-284304114.us-east...	Provisioning...	vpc-0995ac76487dabcc6	2 Availability Zones	application	November 4, 2023, 11:41 (UTC+07:00)

0 load balancers selected

Select a load balancer above.

2.4: Auto Scaling

2.4.1: Create launch template

The screenshot shows two overlapping windows in the AWS CloudShell interface.

Top Window: Create launch template

- Summary:**
 - Software Image (AMI): assignmenmt 2 AMI ami-0f577d51f69334f14
 - Virtual server type (instance type): t2.micro
 - Firewall (security group): DevServerSG_A2
 - Storage (volumes): 1 volume(s) - 8 GiB
- Launch template name and description:**
 - Launch template name - required: DevServerTemplate
 - Template version description: launch temp for dev server
 - Auto Scaling guidance info: Select this if you intend to use this template with EC2 Auto Scaling. Provide guidance to help me set up a template that I can use with EC2 Auto Scaling
 - Template tags: None
 - Source template: None
- Create launch template** button

Bottom Window: Application and OS Images (Amazon Machine Image) - required

- Summary:**
 - Software Image (AMI): assignmenmt 2 AMI ami-0f577d51f69334f14
 - Virtual server type (instance type): t2.micro
 - Firewall (security group): DevServerSG_A2
 - Storage (volumes): 1 volume(s) - 8 GiB
- Application and OS Images (Amazon Machine Image) - required** section:
 - Search bar: Search our full catalog including 1000s of application and OS images
 - Recent AMIs: None
 - My AMIs: Selected
 - Shared with me: None
 - Browse more AMIs: Including AMIs from AWS, Marketplace and the Community
 - Amazon Machine Image (AMI): DevServerAMI**
 - AMI ID: ami-0f577d51f69334f14
 - Creation Date: 2023-11-04T04:30:10.000Z
 - Virtualization: hvm
 - ENAs Enabled: true
 - Root Device Type: ebs
 - Description: assignmenmt 2 AMI
 - Architecture: x86_64
 - AMI ID: ami-0f577d51f69334f14
- Instance type** section
- Create launch template** button

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The screenshot shows the AWS CloudShell interface with multiple tabs open. The active tab is titled "Create a launch template" in the AWS Management Console. The interface includes sections for "Instance type" (selected as t2.micro), "Key pair (login)", "Network settings", and "Storage (volumes)". A summary panel on the right provides details about the selected instance type, including its AMI and storage configuration. A tooltip for the "Free tier" is visible, stating: "Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the regions in which t2.micro is unavailable). Instance usage on free tier AMIs per month: 30 GB of EBS storage, 2 million I/Os, 1 GB of snapshots, and 100 GB of bandwidth to the internet." At the bottom right, there are buttons for "Cancel" and "Create launch template". The status bar at the bottom indicates the user's session information and the date/time.

This screenshot continues the AWS CloudShell session from the previous one. The "Create a launch template" tab is still active. The "Network settings" section now includes a "Security groups" field where a specific VPC security group, "DevServerSG_A2", has been selected. The "Storage (volumes)" section shows an "EBS Volumes" table with one entry: "Volume 1 (AMI Root) (8 GiB, EBS, General purpose SSD (gp2))". A tooltip for the "Free tier" is visible, stating: "Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the regions in which t2.micro is unavailable). Instance usage on free tier AMIs per month: 30 GB of EBS storage, 2 million I/Os, 1 GB of snapshots, and 100 GB of bandwidth to the internet." The "Create launch template" button is present at the bottom right. The status bar at the bottom right shows the session details and the date/time.

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The screenshot shows the AWS CloudShell interface with the URL <https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateTemplate>. The page displays the 'Advanced details' section of a launch template configuration. Key settings include:

- IAM instance profile:** LabInstanceProfile (arn:aws:iam::366309293917:instance-profile/LabInstanceProfile)
- Hostname type:** Don't include in launch template
- DNS Hostname:** Enable resource-based IPv4 (A record) DNS requests Enable resource-based IPv6 (AAAA record) DNS requests
- Instance auto-recovery:** Don't include in launch template
- Shutdown behavior:** Don't include in launch template
- Stop - Hibernate behavior:** Don't include in launch template
- Termination protection:** Don't include in launch template
- Stop protection:** Don't include in launch template
- Detailed CloudWatch monitoring:** Enabled

A summary panel on the right provides information about the free tier, including 750 hours of t2.micro or t3.micro in the regions in which t2.micro is unavailable. It also mentions 300 free-tier usage hours per month, 30 GB of EBS storage, 2 million I/Os, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

At the bottom right of the main window are 'Cancel' and 'Create launch template' buttons. The status bar at the bottom indicates the date and time as 11/4/2023 11:46 AM.

This screenshot shows the continuation of the EC2 launch template creation process. The 'User data - optional' section contains the following shell script:

```
#!/bin/bash
#amazon-linux-extras install -y lamp-mariadb10.2-php7.2 php7.2
service httpd start
yum install -y httpd mariadb-server php-mbstring php-xml
systemctl start httpd
systemctl enable httpd
usermod -a -G apache ec2-user
chown -R ec2-user:apache /var/www
chmod 2775 /var/www
find /var/www -type d -exec sudo chmod 2775 {} \;
find /var/www -type f -exec sudo chmod 6644 {} \;
echo "<?php echo <h2>Welcome to COS80001. Installed PHP version:</h2>?>" > /var/www/html/phpinfo.php
```

A note below the user data states: "User data has already been base64 encoded".

The rest of the interface and status bar are identical to the first screenshot.

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The screenshot shows the AWS CloudShell interface with a terminal window open. The terminal output indicates the successful creation of a launch template named 'DevServerTemplate'.

```
Success
Successfully created DevServerTemplate[lt-0cb99ade9cfa1a7c0].
```

The interface includes a navigation bar with tabs like 'CloudShell', 'Feedback', and 'CloudWatch Metrics'. Below the navigation bar is a toolbar with icons for various AWS services. The main content area displays the 'Next Steps' section for the newly created launch template, which includes options for launching an instance, creating an Auto Scaling group, or creating a Spot Fleet.

2.4.2: Create auto scaling group

The screenshot shows the AWS CloudShell interface with a terminal window open. The terminal output shows the configuration of a launch template named 'DevServerTemplate'.

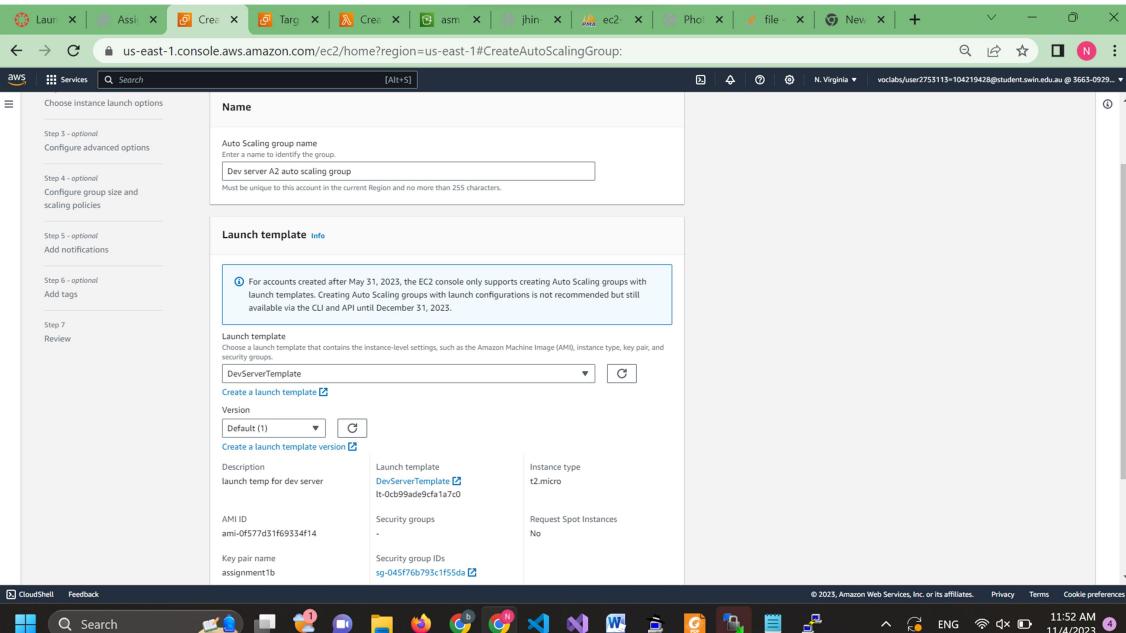
```
Launch template details
Launch template ID: lt-0cb99ade9cfa1a7c0
Launch template name: DevServerTemplate
Default version: 1

Launch template version details
Version: 1 (Default)
Description: launch temp for dev server
Date created: 2023-11-04T04:48:08.000Z
Created by: arnawssts:366309293917:assumed-role/vocabs/user2753113-104219428@student.swin.edu.au

Instance details | Storage | Resource tags | Network interfaces | Advanced details
AMI ID: ami-0f577d51f69334f14
Instance type: t2.micro
Availability Zone: -
Key pair name: assignment1b
Security group IDs: sg-045f76b793c1f55da
```

The interface includes a navigation bar with tabs like 'CloudShell', 'Feedback', and 'CloudWatch Metrics'. Below the navigation bar is a toolbar with icons for various AWS services. The main content area displays the 'Launch template details' and 'Launch template version details' sections for the 'DevServerTemplate'.

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The screenshot shows the AWS CloudShell interface with several tabs open, including Lambda, S3, CloudWatch Logs, and CloudWatch Metrics. The main window displays the 'Create Auto Scaling Group' wizard, Step 3: Choose instance launch options.

Step 3 - optional: Configure advanced options

Step 4 - optional: Configure group size and scaling policies

Step 5 - optional: Add notifications

Step 6 - optional: Add tags

Step 7: Review

Name: Dev server A2 auto scaling group

Launch template: DevServerTemplate

Description: launch temp for dev server

AMI ID: ami-0f577d31f69334f14

Key pair name: assignment1b

Launch template: DevServerTemplate

Version: Default (1)

Description: launch temp for dev server

AMI ID: ami-0f577d31f69334f14

Key pair name: assignment1b

Instance type: t2.micro

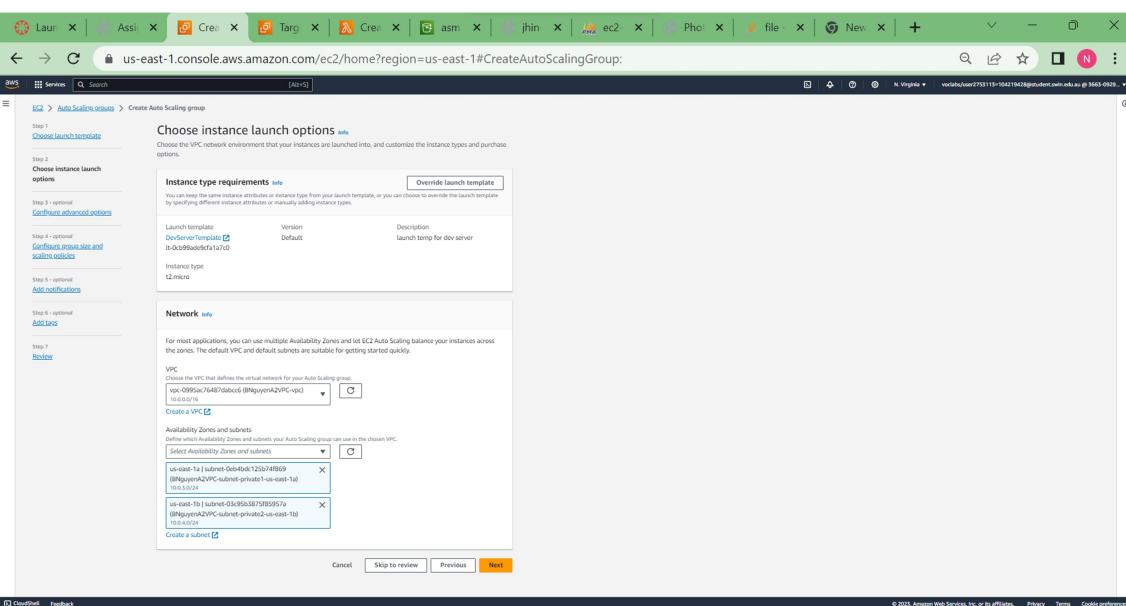
Security groups: -

Request Spot Instances: No

Security group IDs: sg-045f76b793c1f55d1

CloudShell Feedback

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The screenshot shows the 'Create Auto Scaling Group' wizard, Step 4: Choose instance launch options.

Step 1: Choose launch template

Step 2: Choose instance launch options

Step 3 - optional: Configure advanced options

Step 4 - optional: Configure group size and scaling policies

Step 5 - optional: Add notifications

Step 6 - optional: Add tags

Step 7: Review

Choose instance launch options

Instance type requirements: You can keep the same instance attributes or instance type from your launch template, or you can choose to override the launch template by specifying different instance attributes or manually adding instance types.

Launch template: DevServerTemplate

Version: Default

Description: launch temp for dev server

Instance type: t2.micro

Network: For most applications, you can use multiple Availability Zones and let EC2 Auto Scaling balance your instances across the zones. The default VPC and default subnets are suitable for getting started quickly.

VPC: Select the VPC that defines the actual network for your Auto Scaling group.

Select Availability Zones and subnets: Define which Availability Zones and subnets your Auto Scaling group can use in the chosen VPC.

us-east-1a | Subnet-0b84d0125074ff869
(0NgpuynA2VPC-subnet-private1-us-east-1a)
10.0.0.0/24

us-east-1b | Subnet-03f95037379899079
(0NgpuynA2VPC-subnet-private2-us-east-1b)
10.0.0.0/24

Create a subnet

Cancel **Skip to review** **Previous** **Next**

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The screenshot shows the AWS CloudShell interface with multiple tabs open. The active tab is titled "us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup". The page displays the "Create Auto Scaling group" wizard, Step 7: "Review". The "Configure advanced options - optional" section is expanded, showing the "Load balancing" configuration. Under "Load balancing", the "Attach to an existing load balancer" option is selected, with "Choose from your load balancer target groups" checked. A dropdown menu shows "TargetgroupA2 | HTTP Application Load Balancer: ELBa2" selected. Below this, the "Health checks" section is visible, showing "EC2 health checks" enabled. The "Additional settings" section includes "Monitoring" (CloudWatch Metrics collection) and "Default instance warmup" (CloudWatch Metrics collection for new instances). At the bottom, there are "Cancel", "Skip to review", "Previous", and "Next" buttons.

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The screenshot shows the AWS CloudShell interface with multiple tabs open. The active tab is titled "us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup". The page displays the "Create Auto Scaling group" wizard, Step 4: "Configure group size and scaling policies - optional".

Group size - optional

Specify the size of the Auto Scaling group by changing the desired capacity. You can also specify minimum and maximum capacity limits. Your desired capacity must be within the limit range.

Desired capacity: 2

Minimum capacity: 2

Maximum capacity: 3

Scaling policies - optional

Choose whether to use a scaling policy to dynamically resize your Auto Scaling group to meet changes in demand.

Target tracking scaling policy

Choose a desired outcome and leave it to the scaling policy to add and remove capacity as needed to achieve that outcome.

None

Scaling policy name: Target Tracking Policy

Metric type: Application Load Balancer request count per target

Target group: TargetgroupA2

Target value: 30

Instance warmup: 300 seconds

Disable scale in to create only a scale-out policy:

Instance scale-in protection - optional

A Snipping Tool window is visible in the background, showing a screenshot of the AWS console. The message in the Snipping Tool window reads: "Screenshot copied to clipboard and saved Select here to mark up and share the image".

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The screenshot shows the AWS CloudShell interface with three tabs open:

- EC2 > Auto Scaling groups > Create Auto Scaling group**: Step 1: Choose launch template. Step 2: Choose instance launch options. Step 3: optional. Step 4: optional. Step 5: optional. Step 6: optional. Step 7: Review. A modal window titled "Add tags - optional" is open, showing a table with one tag: "Name" (Value: Dev Web). A note says: "You can optionally choose to add tags to instances (and their attached EBS volumes) by specifying tags in your launch template. We recommend caution, however, because the tag values for instances from your launch template will be overridden if there are any duplicate keys specified for the Auto Scaling group."
- EC2 > Auto Scaling groups**: Shows a table of Auto Scaling groups. One group is listed: "Dev server A2 auto scaling group" (Launch template: DevServerTemplate | Version Default, Desired capacity: 2, Min: 2, Max: 3, Availability Zones: us-east-1a, us-east-1b).
- EC2 > Home**: The main EC2 dashboard.

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The screenshot shows the AWS CloudShell interface with the EC2 Instances page open. The left sidebar contains various navigation links such as EC2 Dashboard, EC2 Global View, Instances, Images, Elastic Block Store, Network & Security, and more. The main content area displays a table of instances with columns for Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, Public IPv4 DNS, Public IPv4, and Elastic IP. Five instances are listed:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4	Elastic IP
Bastion/Web s...	i-0264c88efc3959f0f	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b	ec2-52-202-86-40.com...	52.202.86.40	-
Dev Server	i-02525c87ecb5e454	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b	ec2-52-1-196-227.com...	52.1.196.227	-
Dev Web	i-0f19ea0054c53ddf	Running	t2.micro	0/2 checks passed	No alarms	us-east-1b	-	-	-
TestInstance	i-0367e3254fb6b2719	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b	-	-	-
Dev Web	i-04eb5e1b231d32798	Running	t2.micro	0/2 checks passed	No alarms	us-east-1a	-	-	-

Modify both of the Dev Web instance IAM

To LabInstanceProfile

The screenshot shows the AWS CloudShell interface with the Modify IAM role page open for the instance i-04eb5e1b231d32798. The title bar says "Modify IAM role". The page displays the current IAM role assigned to the instance: "i-04eb5e1b231d32798 (Dev Web)". Below this, there is a dropdown menu labeled "IAM role" with the option "LabInstanceProfile" selected. At the bottom right of the form, there is a red "Update IAM role" button.

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2.5: DevServer EC2 Instance

The screenshot shows the AWS CloudShell interface with three tabs open: "Assignment 1a", "Assignment2_UG_v5.0.pdf", and "Launch an instance | EC2 | us-east-1#LaunchInstances". The "Launch an instance | EC2 | us-east-1#LaunchInstances" tab is active, displaying the "Launch an instance" wizard.

Summary

- Number of instances: 1
- Software Image (AMI): Amazon Linux 2 Kernel 5.10 AMI... (ami-0e8a34246278c21e4)
- Virtual server type (instance type): t2.micro
- Firewall (security group): DevServerSG_A2
- Storage (volumes): 1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the regions where it's available). Unavailable instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million I/Os, 1 GB of snapshots, and 100 GiB of bandwidth to the internet.

Launch instance

The CloudShell interface at the bottom shows a standard Windows taskbar with various application icons.

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The screenshot shows the AWS CloudFormation console with a tab for 'Assignment 1a'. The main area displays the configuration for launching an EC2 instance. Key settings include:

- Key pair name**: assignment1b
- VPC**: vpc-09995ac76487dabc6 (B Nguyen A2VPC-vpc)
- Subnet**: subnet-05e18654d4093e88 (B Nguyen A2VPC-subnet-public2-us-east-1b)
- Auto-assign public IP**: Enabled
- Firewall (security group)**: DevServerSG_A2
- Common security groups**: DevServerSG_A2, sg-045f7b0793c1f55da
- Configure storage**: 1 volume(s) - 8 GiB

The right side of the screen shows a summary panel with the following details:

- Number of instances**: 1
- Software Image (AMI)**: Amazon Linux 2 Kernel 5.10 AMI... (ami-0e8a34246278c21e4)
- Virtual server type (instance type)**: t2.micro
- Firewall (security group)**: DevServerSG_A2
- Storage (volumes)**: 1 volume(s) - 8 GiB

A tooltip for the 'Free tier' indicates: "In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million I/Os, 1 GB of snapshots, and 100 GB of bandwidth to the internet."

At the bottom right, there are 'Launch instance' and 'Review commands' buttons.

Re-use the script from assignment 1

This screenshot shows the AWS CloudFormation console with a tab for 'Assignment 2_UG_v5.0.pdf'. The configuration for launching an EC2 instance is identical to the previous screenshot, including the same VPC, subnet, and security group settings.

The 'User data - optional' section contains a base64-encoded shell script:

```
#!/bin/bash
yum update -y
amazon-linux-extras install -y php7.2 php7.2
service httpd start
yum install -y httpd mariadb-server php-mbstring php-zip
systemctl start httpd
systemctl enable httpd
usermod -a -G apache ec2-user
chown -R ec2-user:apache /var/www
chmod 2775 /var/www
find /var/www -type d -exec sudo chmod 2775 {} \;
find /var/www -type f -exec sudo chmod 664 {} \;
echo "<h2>Welcome to C05980001! Installed PHP version: `phpversion`</h2>" > /var/www/html/phpinfo.php
```

A note below the script states: "User data has already been base64 encoded".

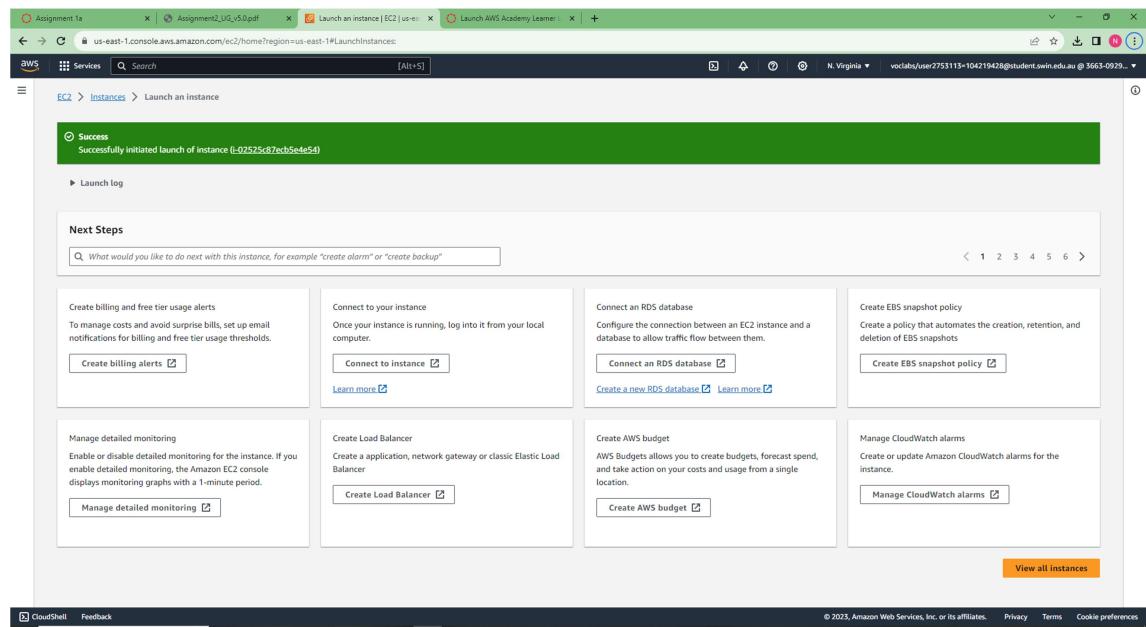
The right side of the screen shows a summary panel with the following details:

- Number of instances**: 1
- Software Image (AMI)**: Amazon Linux 2 Kernel 5.10 AMI... (ami-0e8a34246278c21e4)
- Virtual server type (instance type)**: t2.micro
- Firewall (security group)**: DevServerSG_A2
- Storage (volumes)**: 1 volume(s) - 8 GiB

A tooltip for the 'Free tier' indicates: "In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million I/Os, 1 GB of snapshots, and 100 GB of bandwidth to the internet."

At the bottom right, there are 'Launch instance' and 'Review commands' buttons.

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The screenshot shows the AWS CloudWatch Metrics console. At the top, there are three tabs: 'Assignment 1a', 'Assignment2_UG_5.0.pdf', and 'Launch an instance | EC2 | us-east-1'. Below the tabs, the URL is us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances. The page title is 'Launch an instance' under the 'EC2' service. A green success message box at the top right says 'Successfully initiated launch of instance (I-02525c87ecb5e4e5d)'. Below the message, there's a 'Launch log' link. The main area is titled 'Next Steps' with a sub-section 'Q. What would you like to do next with this instance, for example "create alarm" or "create backup"'.

Next Steps

Q. What would you like to do next with this instance, for example "create alarm" or "create backup"

Create billing and free tier usage alerts
To manage costs and avoid surprise bills, set up email notifications for billing and free tier usage thresholds.
[Create billing alerts](#)

Connect to your instance
Once your instance is running, log into it from your local computer.
[Connect to instance](#) [Learn more](#)

Connect an RDS database
Configure the connection between an EC2 instance and a database to allow traffic flow between them.
[Connect an RDS database](#) [Create a new RDS database](#) [Learn more](#)

Create EBS snapshot policy
Create a policy that automates the creation, retention, and deletion of EBS snapshots.
[Create EBS snapshot policy](#)

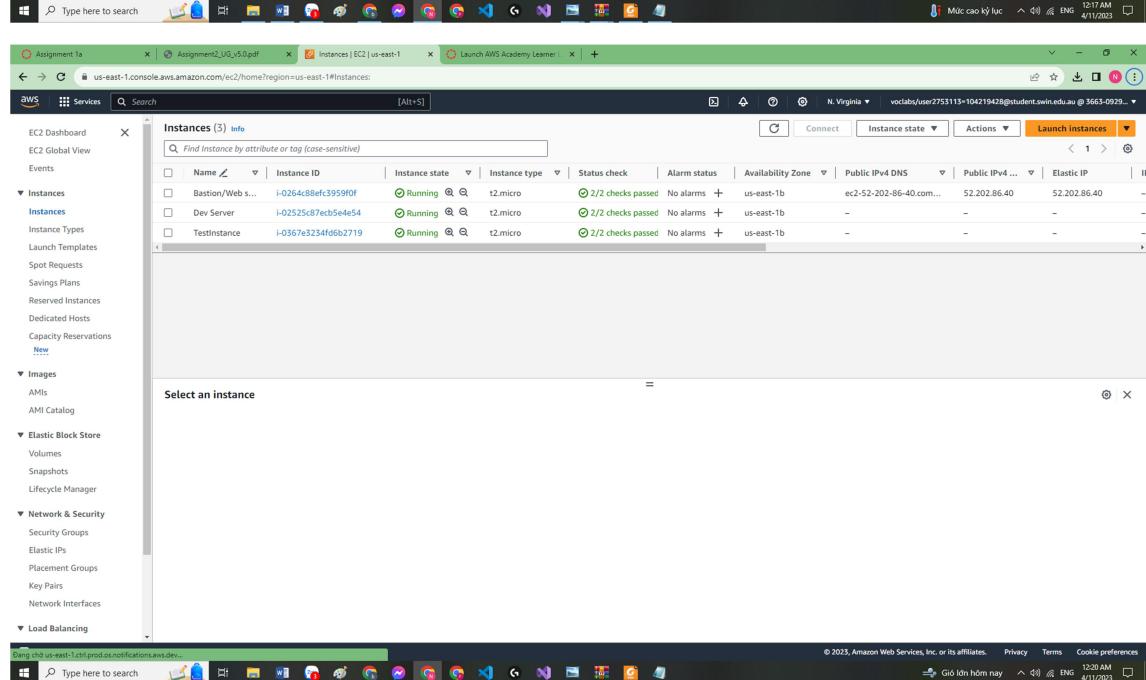
Manage detailed monitoring
Enable or disable detailed monitoring for the instance. If you enable detailed monitoring, the Amazon EC2 console displays monitoring graphs with a 1-minute period.
[Manage detailed monitoring](#)

Create Load Balancer
Create an application, network gateway or classic Elastic Load Balancer.
[Create Load Balancer](#)

Create AWS budget
AWS Budgets allows you to create budgets, forecast spend, and take action on your costs and usage from a single location.
[Create AWS budget](#)

Manage CloudWatch alarms
Create or update Amazon CloudWatch alarms for the instance.
[Manage CloudWatch alarms](#)

[View all instances](#)



The screenshot shows the AWS EC2 Instances dashboard. The left sidebar includes links for EC2 Dashboard, EC2 Global View, Events, Instances (selected), Instances Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, New, Images, AMIs, AMI Catalog, Elastic Block Store, Volumes, Snapshots, Lifecycle Manager, Network & Security, Security Groups, Elastic IPs, Placement Groups, Key Pairs, Network Interfaces, and Load Balancing. The main content area shows a table titled 'Instances (3) Info' with columns: Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, Public IPv4 DNS, Public IPv4 IP, and Elastic IP. The three instances listed are:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 IP	Elastic IP
Bastion/Web s...	i-0264c88efc5959f0f	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b	ec2-52-202-86-40.com...	52.202.86.40	52.202.86.40
Dev Server	i-02525c87ecb5e4e54	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b	-	-	-
TestInstance	i-0367e3234fd6b2719	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b	-	-	-

At the bottom of the dashboard, there is a modal window titled 'Select an instance' which is currently empty.

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2.5.2: Elastic IP

The screenshot shows two consecutive screenshots of the AWS Management Console interface.

Screenshot 1: Allocate Elastic IP address

This screen is titled "Allocate Elastic IP address". It shows the configuration for a new elastic IP address:

- Network Border Group:** us-east-1
- Public IPv4 address pool:** Amazon's pool of IPv4 addresses (selected)
- Global static IP addresses:** A note about AWS Global Accelerator providing global static IP addresses.
- Tags - optional:** A section for adding tags to the resource.
- Buttons:** "Cancel" and "Allocate" (highlighted in orange).

Screenshot 2: Elastic IP addresses (1/1)

This screen displays the newly allocated elastic IP address:

Name	Allocated IPv4 address	Type	Allocation ID	Reverse DNS record	Associate
-	52.1.196.227	Public IP	eipalloc-0e0f3f74a8348fbef	-	Associate Elastic IP address

Details for IP Address 52.1.196.227

Summary

Allocated IPv4 address	Type	Allocation ID	Reverse DNS record
52.1.196.227	Public IP	eipalloc-0e0f3f74a8348fbef	-
Association ID	Scope	Associated Instance ID	Private IP address
VPC	-	-	-

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The screenshot shows a browser window with the AWS Management Console URL: us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#AssociateAddressPublicIp=52.1.196.227. The page title is "Associate Elastic IP address".

The "Resource type" section is set to "Instance". The "Instance" dropdown shows "i-02525c87ecb5e4e54". The "Private IP address" dropdown is empty. The "Reassociation" checkbox is unchecked.

Success Message: "Elastic IP address associated successfully. Elastic IP address 52.1.196.227 has been associated with instance i-02525c87ecb5e4e54"

Elastic IP addresses (1/1) Table:

Name	Allocated IPv4 address	Type	Allocation ID	Associated instance ID	Private IP address
-	52.1.196.227	Public IP	eipalloc-0e0f3f74a8348fbe7	i-02525c87ecb5e4e54	10.0.2.196

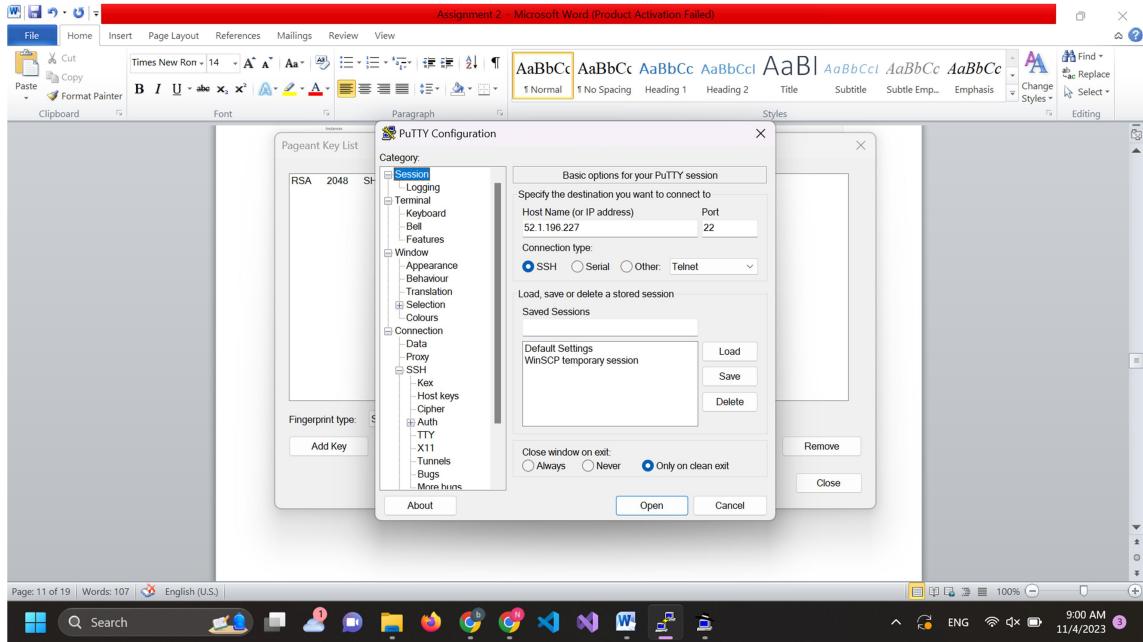
Summary Table:

Allocated IPv4 address	Type	Allocation ID	Reverse DNS record
52.1.196.227	Public IP	eipalloc-0e0f3f74a8348fbe7	-

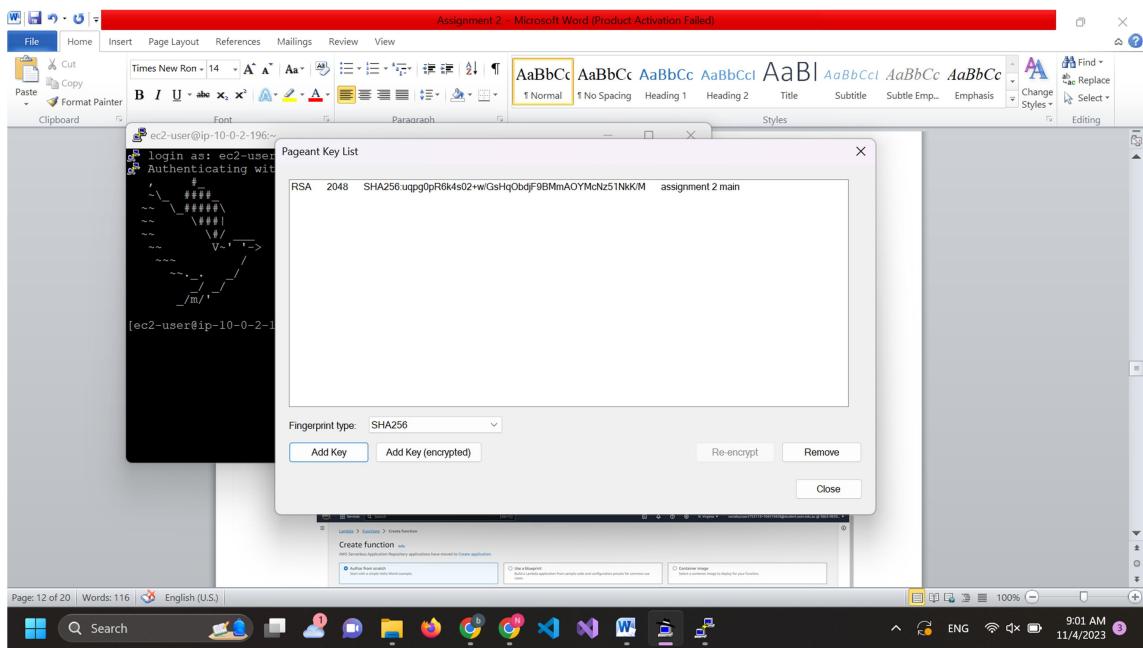
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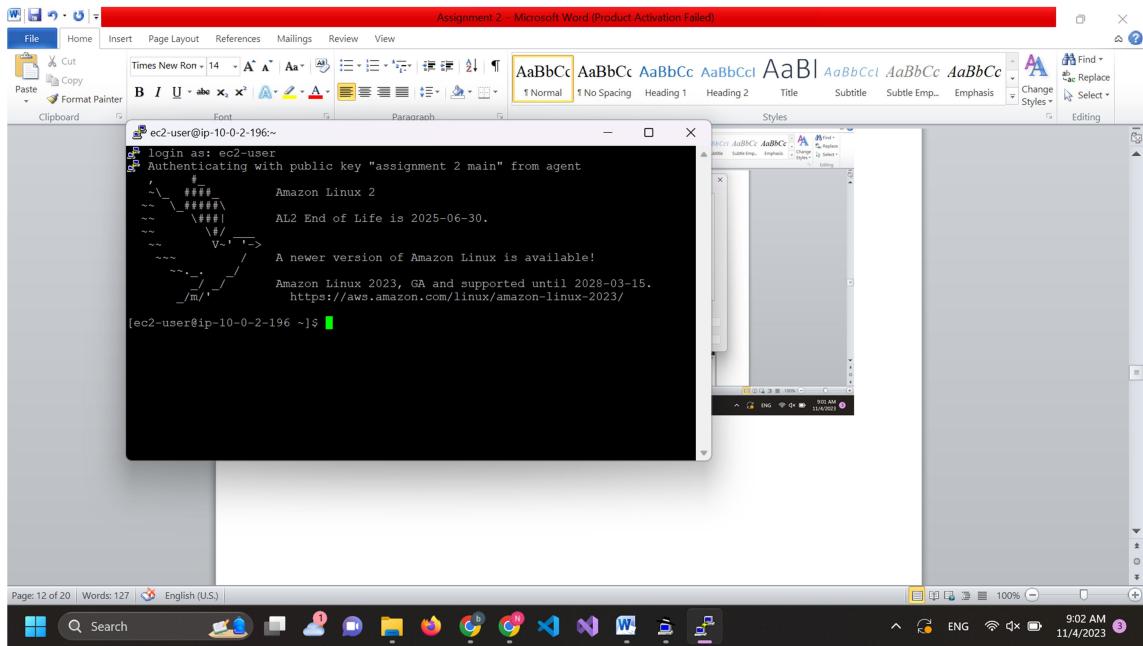
2.5.3: Install PHPmyadmin into Dev Server

Go into Putty and use Dev server public ipv4

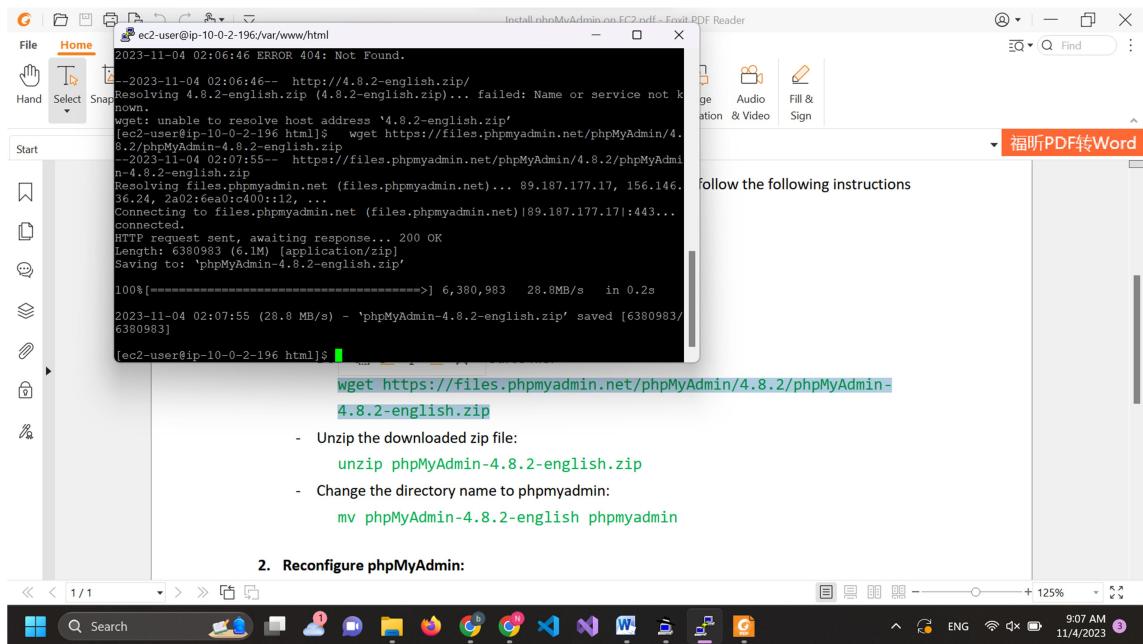


Put the key from assignment 1 (I rename it) into pageant





Now start installing phpmyadmin using the command



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The screenshot shows a Windows desktop environment. At the top, there is a taskbar with various icons. In the center, there are two PDF documents open in Foxit PDF Reader. The left document is titled "Install phpMyAdmin on EC2.pdf" and contains instructions for installing phpMyAdmin. The right document is also titled "Install phpMyAdmin on EC2.pdf". Below the PDFs, a terminal window is open with a green background, showing SSH session logs from an EC2 instance. The logs include commands like "wget", "unzip", and "mv" used to download, extract, and rename the phpMyAdmin package. The terminal prompt is "[ec2-user@ip-10-0-2-196 ~]\$".

1. Download phpMyAdmin:

- SSH into your EC2 instance
- Navigate to the Apache2 directory:
cd /var/www/html
- Download phpMyAdmin:
wget https://files.phpmyadmin.net/phpMyAdmin/4.8.2-english/phpMyAdmin-4.8.2-english.zip
- Unzip the downloaded file:
unzip phpMyAdmin-4.8.2-english.zip
- Change the name of the folder to phpmyadmin:
mv phpMyAdmin-4.8.2-english phpmyadmin

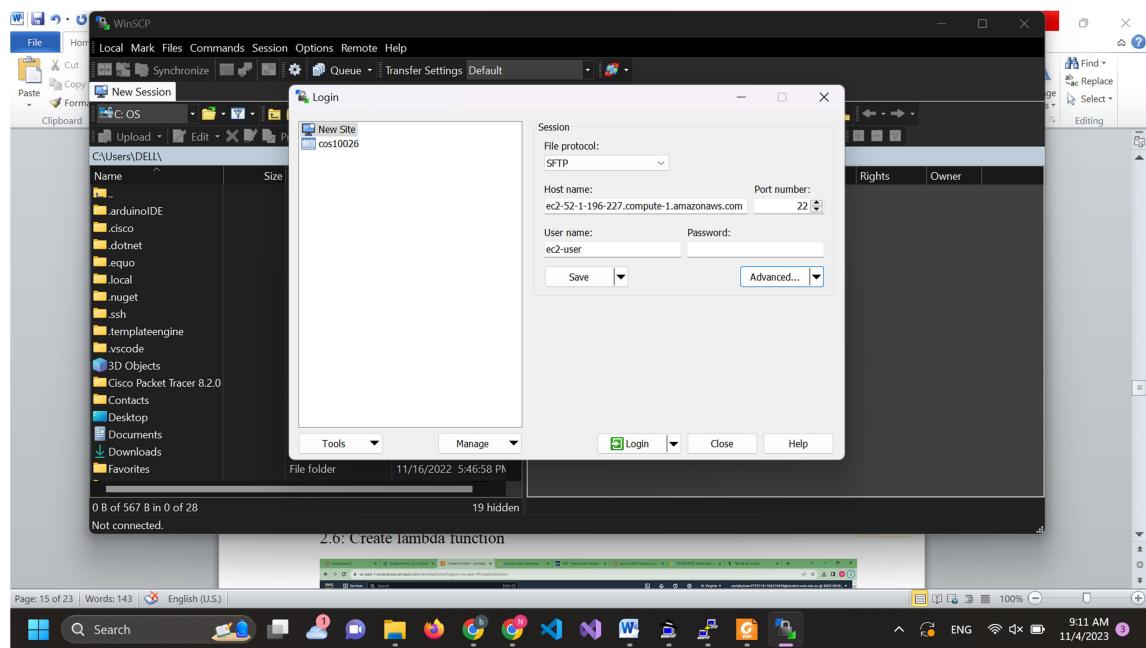
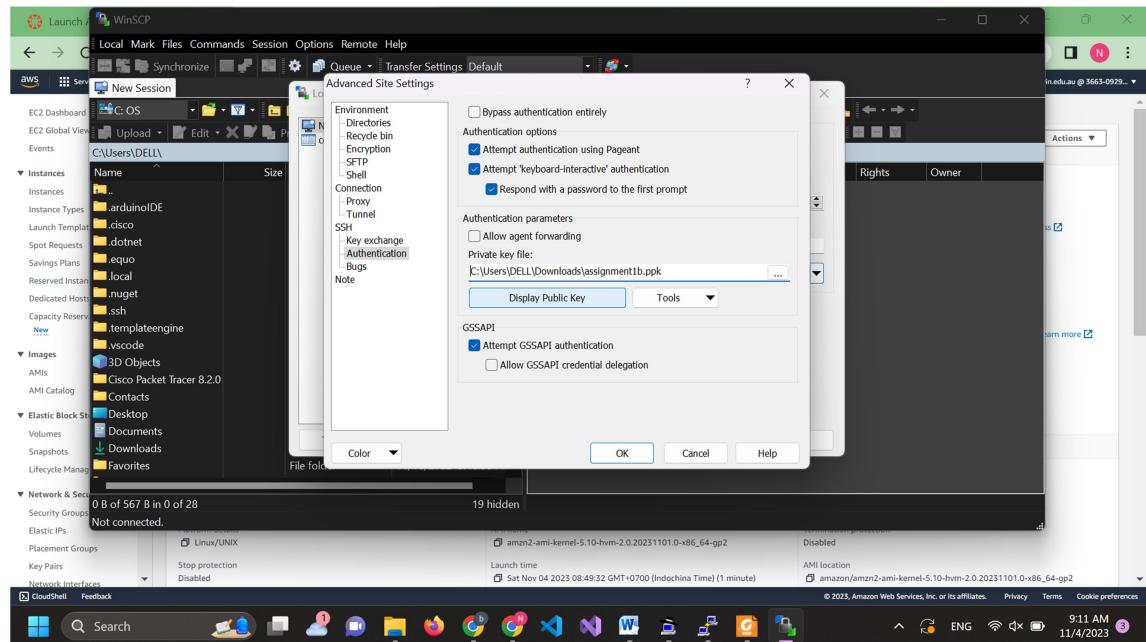
2. Reconfigure phpMyAdmin:

- Download phpMyAdmin:
wget https://files.phpmyadmin.net/phpMyAdmin/4.8.2-english/phpMyAdmin-4.8.2-english.zip
- Unzip the downloaded file:
unzip phpMyAdmin-4.8.2-english.zip
- Change the name of the folder to phpmyadmin:
mv phpMyAdmin-4.8.2-english phpmyadmin

After the command "mv phpMyAdmin-4.8.2-english phpmyadmin" is run, the terminal shows the new directory structure: [ec2-user@ip-10-0-2-196 ~]\$ mv phpMyAdmin-4.8.2-english phpmyadmin

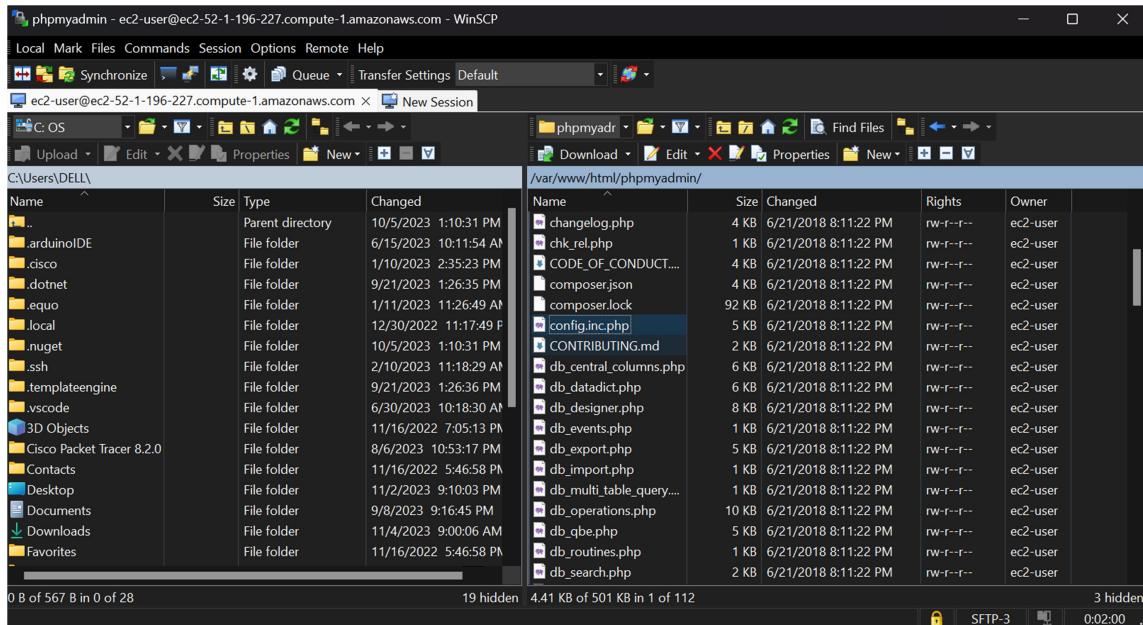
Open Win SCP using Devserver public DNS as Hostname

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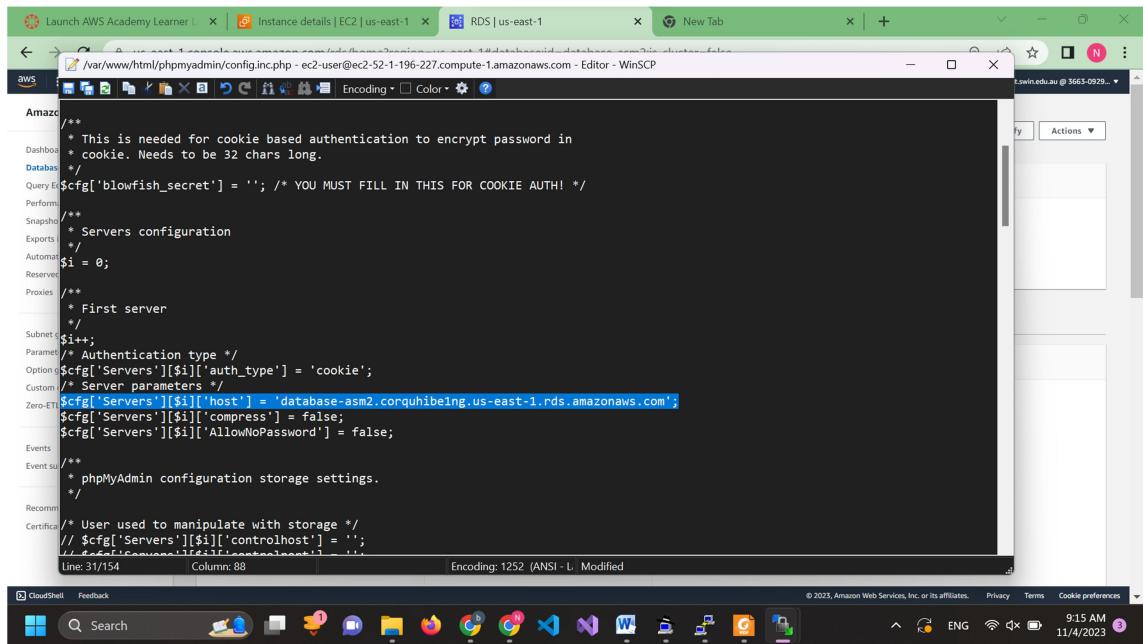


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Reconfigure phpmyadmin

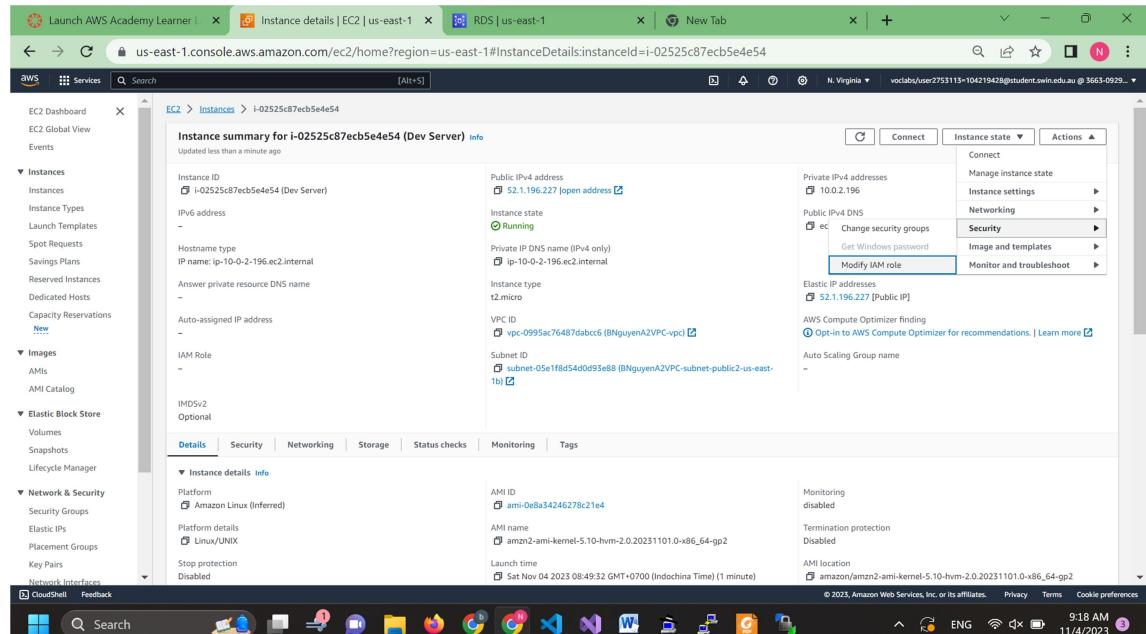


Change “localhost” to my RDS endpoint



Nguyen Gia Binh - 104219428

Modify IAM role



The screenshot shows the AWS EC2 Instances page. The instance summary for i-02525c87ecb5e4e54 (Dev Server) is displayed. The 'Actions' menu is open, and the 'Modify IAM role' option is highlighted.

Instance summary for i-02525c87ecb5e4e54 (Dev Server)

Instance ID: i-02525c87ecb5e4e54 (Dev Server)

Public IPv4 address: 52.1.196.227 [open address]

Private IPv4 address: 10.0.2.196

Instance state: Running

Private IP DNS name (IPv4 only): ip-10-0-2-196.ec2.internal

Instance type: t2.micro

VPC ID: vpc-0995ac76487dabcc6 (vNguenA2VPC-vpc)

Subnet ID: subnet-05e1f8d54d0d93e88 (vNguenA2VPC-subnet-public2-us-east-1b)

IAM Role: -

IMDSv2: Optional

Details | Security | Networking | Storage | Status checks | Monitoring | Tags

Platform: Amazon Linux (Inferred)

AMI ID: ami-0ea34246278c21e4

AMI name: amzn2-ami-kernel-5.10-hvm-2.0.20231101.0-x86_64-gp2

Termination protection: Disabled

Launch time: Sat Nov 04 2023 08:49:32 GMT+0700 (Indochina Time) (1 minute)

AMI location: amazon/amzn2-ami-kernel-5.10-hvm-2.0.20231101.0-x86_64-gp2

Monitoring: disabled

Network & Security:

- Security Groups
- Elastic IPs
- Placement Groups
- Key Pairs
- Network Interfaces

CloudShell | **Feedback**

Modify IAM role | EC2 | us-east-1

The screenshot shows the 'Modify IAM role' dialog for the instance i-02525c87ecb5e4e54. The 'IAM role' dropdown is set to 'LabInstanceProfile'. The 'Update IAM role' button is highlighted.

Modify IAM role

Attach an IAM role to your instance.

Instance ID: i-02525c87ecb5e4e54 (Dev Server)

IAM role: Select an IAM role to attach to your instance or create a new role if you haven't created any. The role you select replaces any roles that are currently attached to your instance.

LabInstanceProfile | **Create new IAM role**

Cancel | **Update IAM role**

CloudShell | **Feedback**

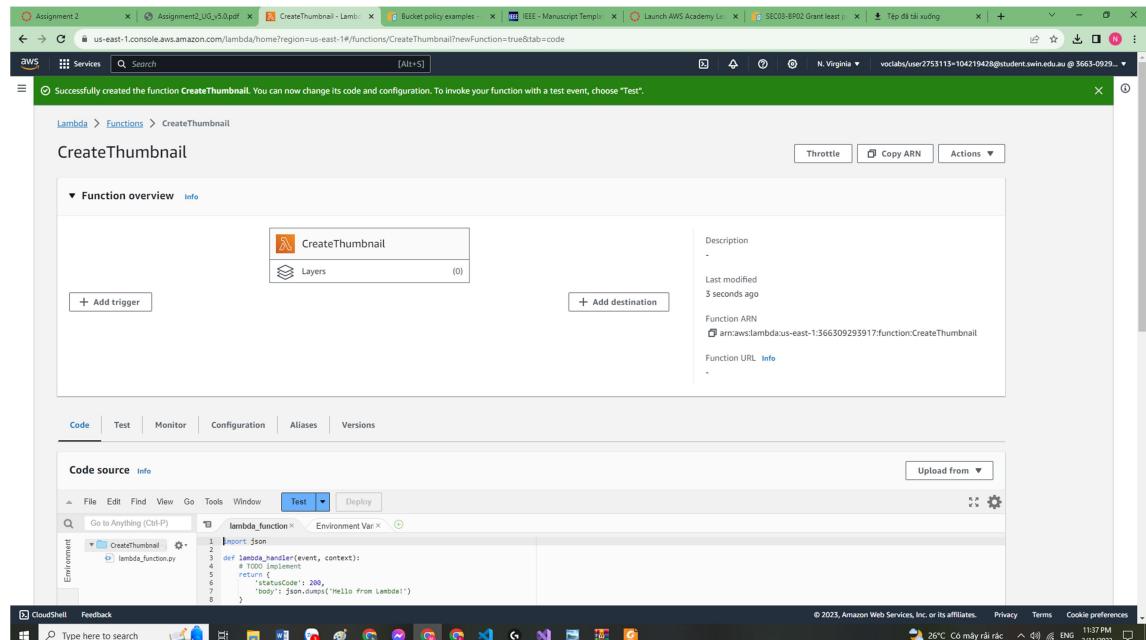
Nguyen Gia Binh - 104219428

The screenshot shows the AWS Lambda console interface. At the top, there are several tabs: 'Launch AWS Academy Learner', 'Instances | EC2 | us-east-1', 'RDS | us-east-1', 'New Tab', and a search bar. Below the tabs, the main content area displays a table titled 'Successfully attached LabInstanceProfile to instance i-02525c87ecb5e4e54'. The table lists three instances: 'Bastion/Web S...', 'Dev Server', and 'TestInstance', all in the 'Running' state. The table includes columns for Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, Public IPv4 DNS, Public IPv4, and Elastic IP. On the left side, there is a sidebar with navigation links for EC2 Dashboard, EC2 Global View, Events, Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images, AMIs, AMI Catalog, Elastic Block Store, Volumes, Snapshots, Lifecycle Manager, Network & Security, Security Groups, Elastic IPs, Placement Groups, Key Pairs, and Network Interfaces. At the bottom of the screen, there is a Windows taskbar with various pinned icons.

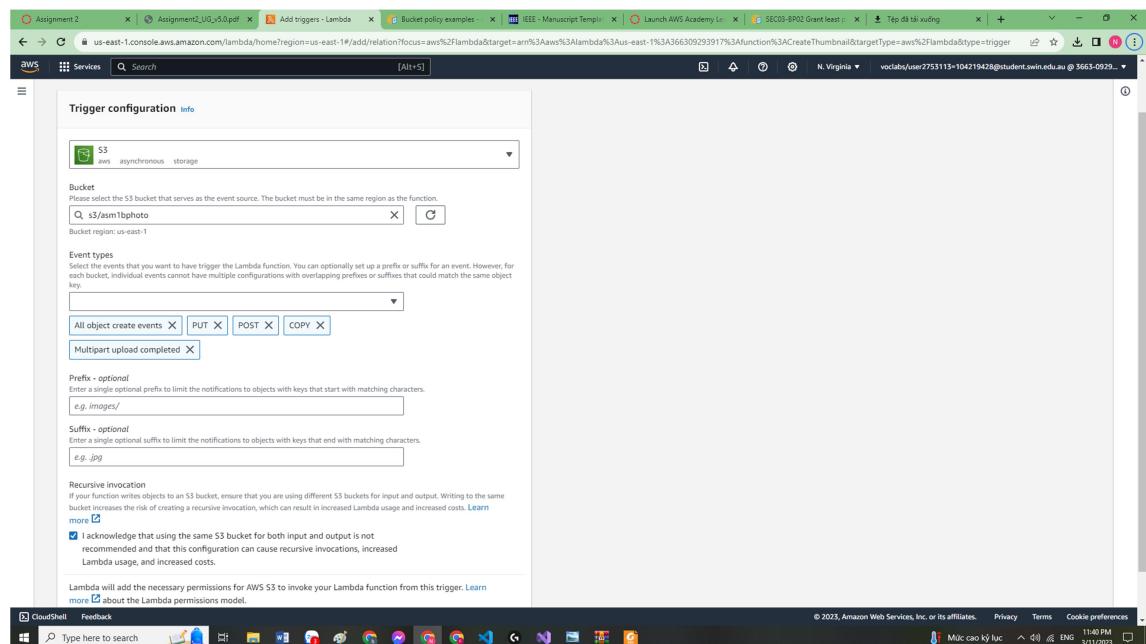
2.6: Create lambda function

The screenshot shows the 'Create function' wizard in the AWS Lambda console. The title bar says 'Create function - Lambda'. The main area has three options: 'Author from scratch' (selected), 'Use a blueprint', and 'Container image'. Below these are sections for 'Basic information', 'Runtime info', 'Architecture info', and 'Permissions info'. In 'Basic information', the function name is 'CreateThumbnail'. In 'Runtime info', the language is set to 'Python 3.7'. In 'Architecture info', the instruction set architecture is 'x86_64'. In 'Permissions info', the default execution role is selected. At the bottom, there is a 'CloudShell' feedback section and a Windows taskbar.

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2.6.2: Configure the trigger:



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The screenshot shows the AWS Lambda console interface. A green banner at the top indicates "Successfully updated the function CreateThumbnail." Below this, the "CreateThumbnail" function details are shown. The "Function overview" tab is selected, displaying a trigger configuration where "S3" is listed under "Destinations". The "Code source" tab shows a note: "The deployment package of your Lambda function 'CreateThumbnail' is too large to enable inline code editing. However, you can still invoke your function." At the bottom, the browser address bar shows the URL <https://us-east-1.console.aws.amazon.com/lambda/home?region=us-east-1#/functions/CreateThumbnail?tab=code>.

2.6.3: Upload a deployment package that I download from Canvas

The screenshot shows the AWS Lambda console interface. The "Code source" tab is active, displaying a file browser window. A modal dialog titled "Upload a .zip file" is open, prompting the user to "Upload a new .zip file package, it overwrites the existing code." A file named "Lambda-deployment-package.zip" (3.37 MB) is selected for upload. The "Save" button is visible at the bottom right of the modal. The browser address bar shows the URL <https://us-east-1.console.aws.amazon.com/lambda/home?region=us-east-1#/functions/CreateThumbnail?tab=code>.

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Successfully updated the function CreateThumbnail.

Code source Info

The deployment package of your Lambda function "CreateThumbnail" is too large to enable inline code editing. However, you can still invoke your function.

Code properties Info

Package size
3.2 MB

SHA256 hash
Y5Kc5SugiAUH2etMC6kGV22ufc8PdpwpK30hn+aKEg=

Last modified
November 3, 2023 at 11:37 PM GMT+7

Runtime settings Info

Runtime
Python 3.7

Handler Info
lambda_function.lambda_handler

Architecture Info
x86_64

Layers Info

Upload photoalbum into the dev server

2.7: RDS database

2.7.1: Create the database subnet group

RDS > Subnet groups > Create DB subnet group

Create DB subnet group

To create a new subnet group, give it a name and a description, and choose an existing VPC. You will then be able to add subnets related to that VPC.

Subnet group details

Name
You won't be able to modify the name after your subnet group has been created.
DBsubnetgroup_A2

Description
db subnet group for asm2

VPC
Choose a VPC Identifier that corresponds to the subnets you want to use for your DB subnet group. You won't be able to choose a different VPC identifier after your subnet group has been created.
BNguyenA2VPC-vpc (vpc-0995ac76487dabcc6)

Add subnets

Availability Zones
Choose the Availability Zones that include the subnets you want to add.
Choose an availability zone
us-east-1a X us-east-1b X

Subnets
Choose the subnets that you want to add. The list includes the subnets in the selected Availability Zones.
Select subnets
subnet-03c95b5875f85957a (10.0.4.0/24) X

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The screenshot shows the AWS RDS console under the 'Subnet groups' section. A new subnet group is being created with the identifier 'BNguyenA2VPC-vpc'. The 'Add subnets' step is selected, showing two subnets from the 'us-east-1a' availability zone: 'subnet-03c95b3875f85957a (10.0.4.0/24)' and 'subnet-0eb4bdc125b74f869 (10.0.3.0/24)'. A note indicates that for Multi-AZ DB clusters, three subnets in three different Availability Zones must be selected. The 'Subnets selected (2)' table lists the chosen subnets. The 'Create' button is highlighted at the bottom right.

2.7.2: Config the database

The screenshot shows the 'Create database' step in the AWS RDS console. Under 'Choose a database creation method', the 'Standard create' option is selected. In the 'Engine options' section, the 'MySQL' engine type is chosen. To the right, a sidebar provides information about MySQL, stating it's the most popular open-source database and listing its features: up to 64 TiB, General Purpose, Memory Optimized, and Burstable Performance instance classes, automated backup, point-in-time recovery, and up to 15 Read Replicas per instance. The 'Create' button is visible at the bottom right.

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The screenshot shows the AWS RDS MySQL Community setup wizard. On the left, a sidebar lists various RDS services like Dashboard, Databases, and Snapshots. The main area has sections for Known issues/limitations, Hide filters, Engine Version (MySQL 8.0.28), Templates (Production, Dev/Test, Free tier selected), and Availability and durability. A note at the bottom says "Deployment options: Info". The right side displays the MySQL product details, including its popularity and features.

The screenshot shows the AWS RDS MySQL instance configuration settings. It includes fields for DB instance identifier (Database-AS2M2), Master username (admin), and Master password (two fields for confirmation). A note states "If you manage the master user credentials in Secrets Manager, some RDS features aren't supported." Below this is an Auto generate a password checkbox. The right side shows the MySQL product details again.

Password: lickmya707

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The screenshot shows the 'Instance configuration' section of the AWS RDS console. On the left, a sidebar lists various RDS services like Dashboard, Databases, and Snapshots. The main area is titled 'Instance configuration' and contains two tabs: 'DB instance class' and 'Storage'. Under 'DB instance class', the 'Burstable classes (includes t classes)' option is selected. Under 'Storage', the 'General Purpose SSD (gp2)' storage type is chosen, and the allocated storage is set to 20 GiB. A note states: 'After you modify the storage for a DB instance, the status of the DB instance will be in storage-optimization. Your instance will remain available as the storage-optimization operation completes.' A 'Learn more' link is provided. On the right, a 'MySQL' summary card highlights its features: supports database sizes up to 64 TiB, general purpose, memory optimized, and burstable performance instances, automated backup, point-in-time recovery, and up to 15 read replicas per instance.

The screenshot shows the 'Connectivity' section of the AWS RDS console. The sidebar remains the same. The main area has two tabs: 'Compute resource' and 'Network type'. Under 'Compute resource', the 'Don't connect to an EC2 compute resource' option is selected. Under 'Network type', 'IPv4' is chosen. A note says: 'After a database is created, you can't change its VPC.' On the right, a 'MySQL' summary card reiterates its features: supports database sizes up to 64 TiB, general purpose, memory optimized, and burstable performance instances, automated backup, point-in-time recovery, and up to 15 read replicas per instance.

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The screenshot shows the AWS RDS MySQL setup wizard. On the left sidebar, there are several tabs: Dashboard, Databases, Query Editor, Performance insights, Snapshots, Exports in Amazon S3, Automated backups, Reserved instances, Proxies, Subnet groups, Parameter groups, Option groups, Custom engine versions, Zero-ETL Integrations, Events, Event subscriptions, Recommendations, and Certificate update.

The main panel has sections for Public access, VPC security group (firewall), Existing VPC security groups, Availability Zone, RDS Proxy, Certificate authority - optional, and Database authentication.

On the right side, there is a detailed description of MySQL and its features:

- MySQL is the most popular open source database in the world.
- MySQL on RDS offers the rich features of the MySQL community edition with the flexibility to easily scale compute resources and storage capacity for your database.
- Supports database size up to 64 TiB.
- Supports General Purpose, Memory Optimized, and Burstable Performance instance classes.
- Supports automated backup and point-in-time recovery.
- Supports up to 15 Read Replicas per instance, within a single Region or 5 read replicas cross-region.

The screenshot shows the AWS RDS Databases page. A success message at the top says "Successfully created DB subnetgroup A2 View subnet group". Below it, there are two notifications: "Creating database database-asm2" and "Introducing Aurora I/O-Optimized".

The main area displays a table of databases:

DB identifier	Status	Role	Engine	Region & AZ	Size	Actions	CPU	Current activity	Maintenance	VPC
assignment1b-db	Available	Instance	MySQL Community	us-east-1a	db.t3.micro	2 Actions	2.66%	0 Connections	none	vpc-0a77c0d69006
database-asm2	Creating	Instance	MySQL Community	-	db.t3.micro	-	-	-	none	vpc-0995ac76487d

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The screenshot shows the AWS RDS console with the database-asm2 instance selected. The main summary table provides key information:

DB identifier	CPU	Status	Class
database-asm2	3.18%	Available	db.t3.micro
Role	Current activity	Engine	Region & AZ
Instance	0 Connections	MySQL Community	us-east-1b

The Connectivity & security tab is active, displaying network configuration details such as Endpoint, VPC, Subnet group, and Subnets.

Access phpmyadmin through ec2 instance

<http://ec2-52-1-196-227.compute-1.amazonaws.com/phpmyadmin/>

The screenshot shows a browser window with the phpMyAdmin login page. The URL is <http://ec2-52-1-196-227.compute-1.amazonaws.com/phpmyadmin/>. The page features the phpMyAdmin logo and a "Welcome to phpMyAdmin" message. A "Log in" form is displayed with fields for "Username" and "Password".

The screenshot shows the phpMyAdmin configuration page. It includes sections for General settings (Change password, Server connection collation set to utf8mb4_unicode_ci), Appearance settings (Theme set to pmahomme, Font size set to 82%), Database server (Server: database-asm2.corquhibeing.us-east-1.rds.amazonaws.com via TCP/IP, Server type: MySQL, Server connection: SSL is not being used, Server version: 8.0.28 - Source distribution, Protocol version: 10, User: admin@10.0.2.196, Server charset: UTF-8 Unicode (utf8)), Web server (Apache/2.4.58, Database client version: libmysql - mysqlnd 5.0.12-dev - 20150407 - \$Id: 3591daad22de08524295eb073aceff11e6579 \$, PHP extension: mysqli, curl, mbstring, PHP version: 7.2.34), and phpMyAdmin (Version information: 4.8.2, latest stable version: 5.2.1, Documentation, Official Homepage). The status bar at the bottom shows the date and time as 9:36 AM 11/4/2023.

Create the database call photo and create its table using this SQL

```
CREATE TABLE photo (
    title VARCHAR(255),
    description VARCHAR(255),
    date DATE,
    keywords VARCHAR(255),
    refference VARCHAR(255)
);
```

The screenshot shows the phpMyAdmin SQL query editor. A query has been entered to create a table named 'photo' with columns: title (VARCHAR(255)), description (VARCHAR(255)), date (DATE), keywords (VARCHAR(255)), and refference (VARCHAR(255)). The query is as follows:

```
1 CREATE TABLE photo (
2     title VARCHAR(255),
3     description VARCHAR(255),
4     date DATE,
5     keywords VARCHAR(255),
6     refference VARCHAR(255)
7 );
```

The status bar at the bottom shows the date and time as 9:39 AM 11/4/2023.

Nguyen Gia Binh - 104219428

The screenshot shows a browser window with multiple tabs open. The active tab is 'ec2-52-1-196-227' on 'phpmyadmin/db_sql.php?db=photo'. The left sidebar shows a database structure with databases like 'information_schema', 'mysql', 'performance_schema', 'photo', and 'sys'. The main area displays a query result: '1 row inserted. (Query took 0.0090 seconds.)' followed by the SQL command: 'INSERT INTO photo (title, description, date, keywords, reference) VALUES ('Jhin', 'Jhin wallpaper', '2023-11-04', 'Jhin, darkstar, wallpaper', 'https://asm1bpphoto.s3.amazonaws.com/dark-cosmic-jhin-splash-art-lol-4k-87.jpg')'. Below the query result are links for '[Edit inline]', '[Edit]', and '[Create PHP code]'. At the bottom of the page, there's a 'Console' section and a Windows taskbar at the bottom.

Test if the Photo is visible when access from EC2 public DNS (this is before I change the bucket policy)

The screenshot shows a browser window with the URL 'ec2-52-1-196-227.compute-1.amazonaws.com/photoalbum/album.php'. The page displays student information: 'Student name: Nguyen Gia Binh', 'Student ID: 104219428', and 'Tutorial session: Saturday 12:00AM'. Below this, it says 'Uploaded photos:' and shows a table with one row:

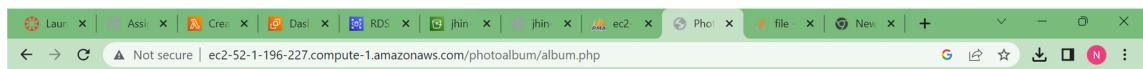
Photo	Name	Description	Creation date	Keywords
	Jhin	Jhin wallpaper	2023-11-04	Jhin, darkstar, wallpaper

At the bottom of the page, there are links for 'Allow P...', 'Remove...', and '+'. A Windows taskbar is visible at the bottom of the screen.

Testing upload photo

There are 2 broken row because I change the photouploader file so it got broken but the 3 attempt is using the original photouploader php file

Nguyen Gia Binh - 104219428



Student name: Nguyen Gia Binh

Student ID: 104219428

Tutorial session: Saturday 12:00AM

Uploaded photos:

[Upload more photos](#)

Photo	Name	Description	Creation date	Keywords
	Jhin	Jhin wallpaper	2023-11-04	Jhin, darkstar, wallpaper
	Jhin_cool2	Jhinattack2		attack ult
	Jhin_cool2	Jhinattack2		attack ult
	Jhin_cool2123	123123	2023-11-04	attack ult12323123



Resizing photo

2.8: Security group

A screenshot of the AWS EC2 Security Groups console. The user has modified an inbound security group rule for a security group named "sg-0acd87d4cc36047fe | ELBSGA2". The "Inbound rules" section shows two entries: one for port 80 (HTTP) and one for port 443 (HTTPS). Both rules allow traffic from 0.0.0.0/0. The "Details" tab shows the security group's configuration, including its name, ID, owner, and VPC ID.

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The screenshot shows the AWS CloudShell interface with the AWS Management Console open. The URL is <https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#SecurityGroup:group-id=sg-0c9e68c9dc95735ee>. The page displays the details of a security group named 'sg-0c9e68c9dc95735ee - WebServerSG_A2'. The 'Details' section shows the security group ID as 'sg-0c9e68c9dc95735ee', description as 'webserver security group for asm2', VPC ID as 'vpc-0995ac76487dabcc6', owner as '366309293917', inbound rules count as 2, and outbound rules count as 0. The 'Inbound rules' tab is selected, showing two entries:

Name	Security group rule...	IP version	Type	Protocol	Port range	Source	Description
-	sgr-05a2333dcf1d20629	IPv4	HTTP	TCP	80	0.0.0.0/0	-
-	sgr-0e08c02c78bfff76	IPv4	SSH	TCP	22	0.0.0.0/24	-

The screenshot shows the AWS CloudShell interface with the AWS Management Console open. The URL is <https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#SecurityGroup:group-id=sg-0c190b1b8acf577a1>. The page displays the details of a security group named 'sg-0c190b1b8acf577a1 - NATServerSG_A2'. The 'Details' section shows the security group ID as 'sg-0c190b1b8acf577a1', description as 'NAT security group for asm2', VPC ID as 'vpc-0995ac76487dabcc6', owner as '366309293917', inbound rules count as 1, and outbound rules count as 1. The 'Inbound rules' tab is selected, showing one entry:

Name	Security group rule...	IP version	Type	Protocol	Port range	Source	Description
-	sgr-01c9f284a5f1a1ff6	IPv4	Custom TCP	TCP	0	0.0.0.0/24	-

Nguyen Gia Bin - 104219428

Details

sg-045f76b793c1f55da - DevServerSG_A2

Security group name: DevServerSG_A2

Security group ID: sg-045f76b793c1f55da

Description: dev server security group for asm 2

VPC ID: vpc-0995ac76487dabcc6

Owner: 366309293917

Inbound rules count: 4

Outbound rules count: 1

Permission entries: 1

Inbound rules (4)

Name	Security group rule...	IP version	Type	Protocol	Port range	Source	Description
-	sgr-04083b5a7b06c77...	IPv4	SSH	TCP	22	0.0.0.0/0	-
-	sgr-05023fa20159021c8	-	HTTP	TCP	80	sg-0c190b1b8acf577a...	-
-	sgr-0a6b53e904d019...	IPv4	All TCP	TCP	0-65535	0.0.0.0/0	-
-	sgr-05f5724d083a32d7b	-	HTTPS	TCP	443	sg-0e190b1b8acf577a...	-

2.9: Network ACL

Create network ACL

A network ACL is an optional layer of security that acts as a firewall for controlling traffic in and out of a subnet.

Network ACL settings

Name - optional
Creates a tag with a key of 'Name' and a value that you specify.
NACLA2

VPC
VPC to use for this network ACL
vpc-0995ac76487dabcc6 (BNguyenA2VPC-vpc)

Tags

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

Key: Name Value: NACLA2

Add tag

You can add 49 more tags

Create network ACL

Nguyen Gia Binh - 104219428

The screenshot shows the AWS VPC console with the URL <https://us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#NetworkAclDetails:networkAclId=acl-00aafe6b37e53eb85>. The main content area displays the details for Network ACL acl-00aafe6b37e53eb85 / NACL2. It shows the following information:

Network ACL ID	Associated with	Default	VPC ID
acl-00aafe6b37e53eb85	-	No	vpc-0995ac76487dabcc6 / BNguenA2VPC-vpc

The "Inbound rules" tab is selected, showing 7 rules:

Rule number	Type	Protocol	Port range	Source	Allow/Deny
1	All ICMP - IPv4	ICMP (1)	All	0.0.0.0/0	Allow
2	Custom TCP	TCP (6)	32768 - 65535	0.0.0.0/0	Allow
3	HTTPS (443)	TCP (6)	443	0.0.0.0/0	Allow
4	SSH (22)	TCP (6)	22	0.0.0.0/0	Allow
5	MySQL/Aurora (3306)	TCP (6)	3306	0.0.0.0/0	Allow
6	All traffic	All	All	0.0.0.0/0	Allow
*	All traffic	All	All	0.0.0.0/0	Deny

At the bottom right of the browser window, it says "Edit inbound rules".

The screenshot shows the AWS VPC console with the same URL as the previous screenshot. The main content area displays the details for Network ACL acl-00aafe6b37e53eb85 / NACL2. It shows the following information:

Network ACL ID	Associated with	Default	VPC ID
acl-00aafe6b37e53eb85	2 Subnets	No	vpc-0995ac76487dabcc6 / BNguenA2VPC-vpc

The "Subnet associations" tab is selected, showing 2 associations:

Name	Subnet ID	Associated with	Availability Zone	IPv4 CIDR	IPv6 CIDR
BNguenA2VPC-subnet-private...	subnet-03c95b375f859574	acl-00aafe6b37e53eb85 / NACL2	us-east-1b	10.0.4.0/24	-
BNguenA2VPC-subnet-private...	subnet-0eb4bdc123674f869	acl-00aafe6b37e53eb85 / NACL2	us-east-1a	10.0.3.0/24	-

At the bottom right of the browser window, it says "Edit subnet associations".