

Assignment 1B – Creating and Deploying Photo Album website onto a simple AWS Infrastructure

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Lab session: Friday 4:30-6:30

INTRODUCTION

In this we are creating and deploying photo album website onto a simple AWS Infrastructure using VPC, Internet gateway, EC2, and using a website to store the metadata about the information of the photo uploaded to the S3 in a MySQL Database managed by Amazon RDS.

Given Cloud Diagram which I used

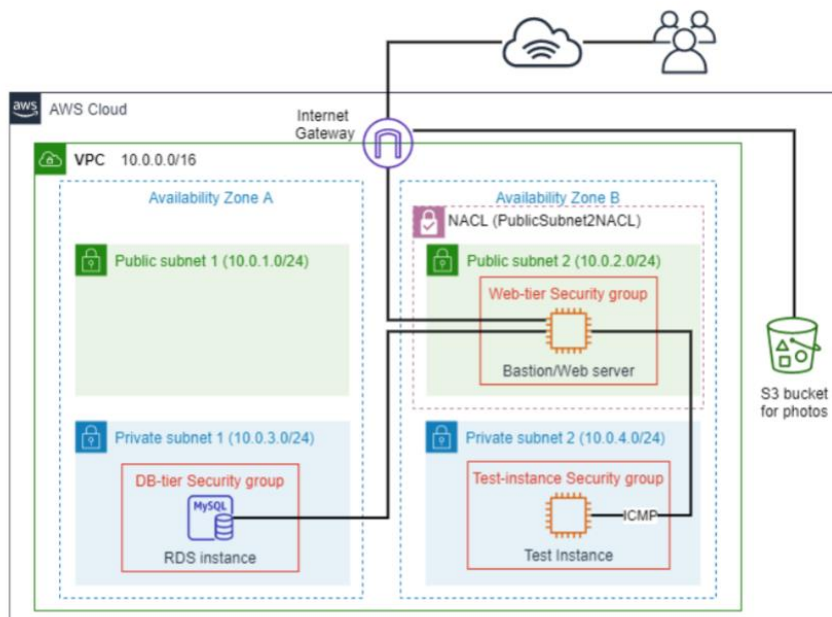


Fig 1.1 Cloud architecture

Creating a VPC with subnets as specified in diagram in the task pdf.

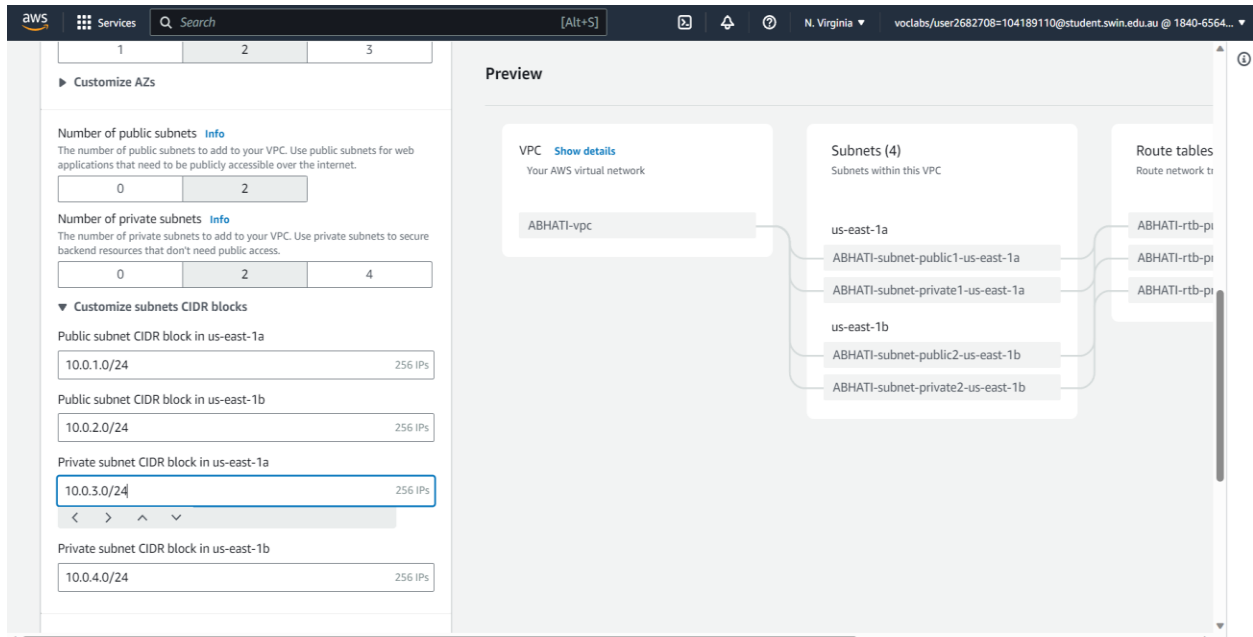


Fig 1.2 creating and configuring a VPC

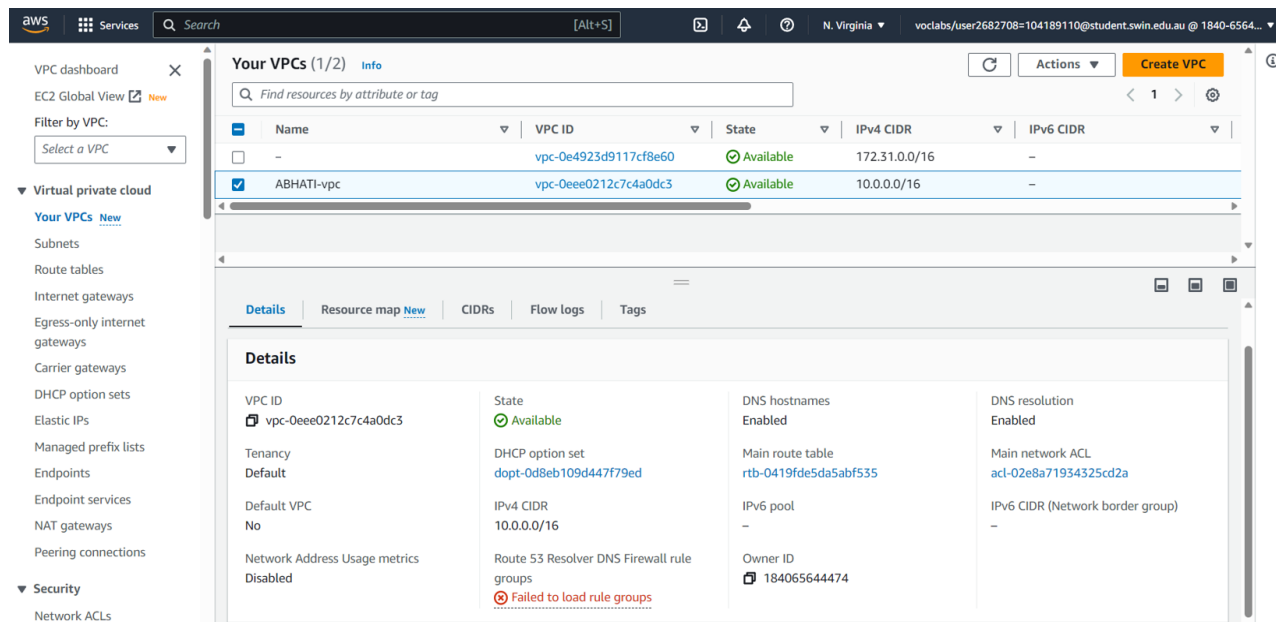


Fig 1.3 checking VPC status

Created (WebServerSG, DBServerSG, TestInstanceSG) “3” Security Group from the given Table

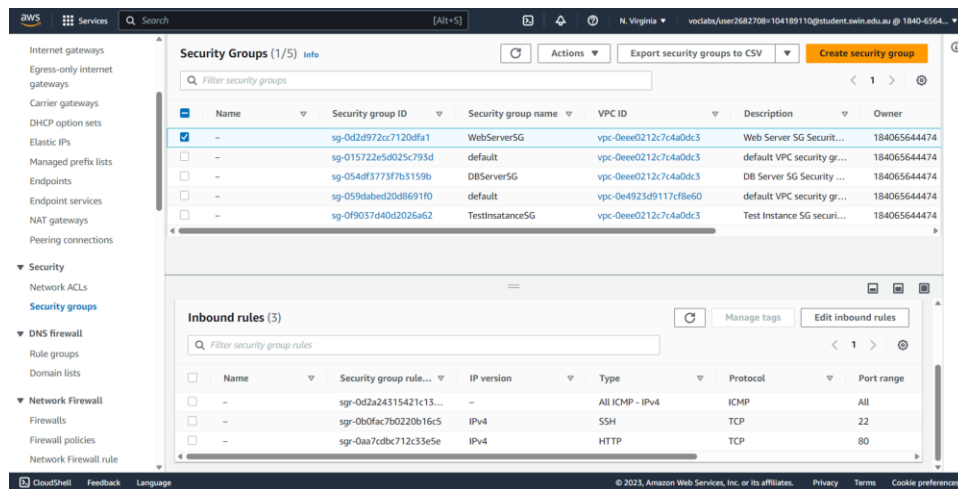


Fig 1.4 security groups

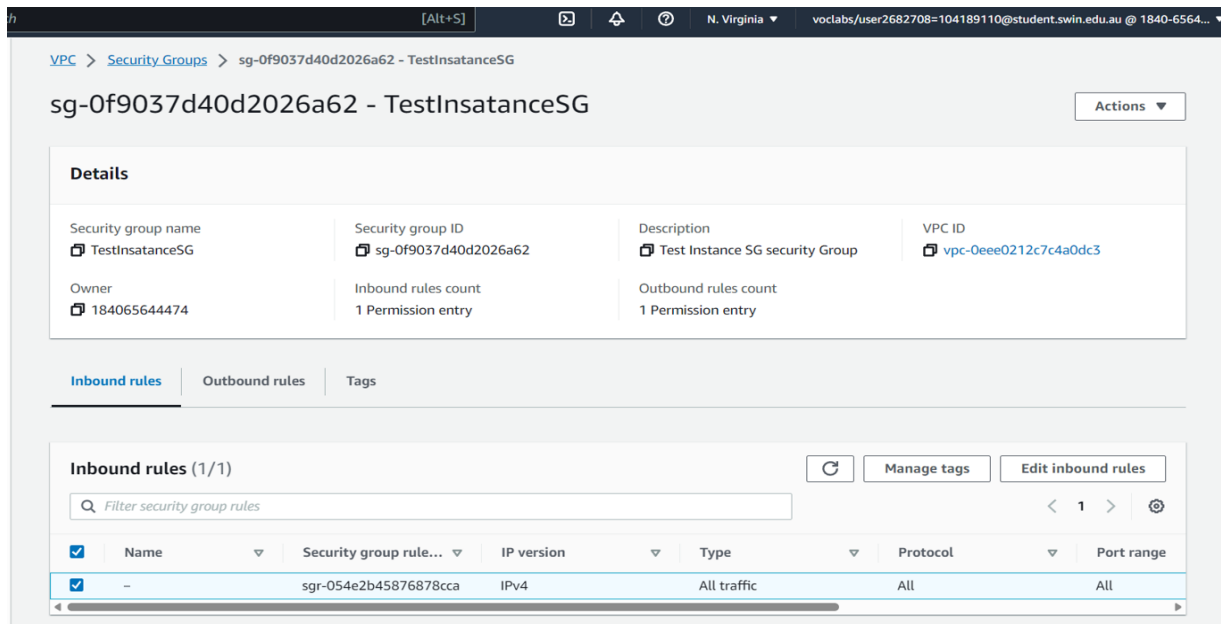


Fig 1.5 security group 1 TestInstanceSG

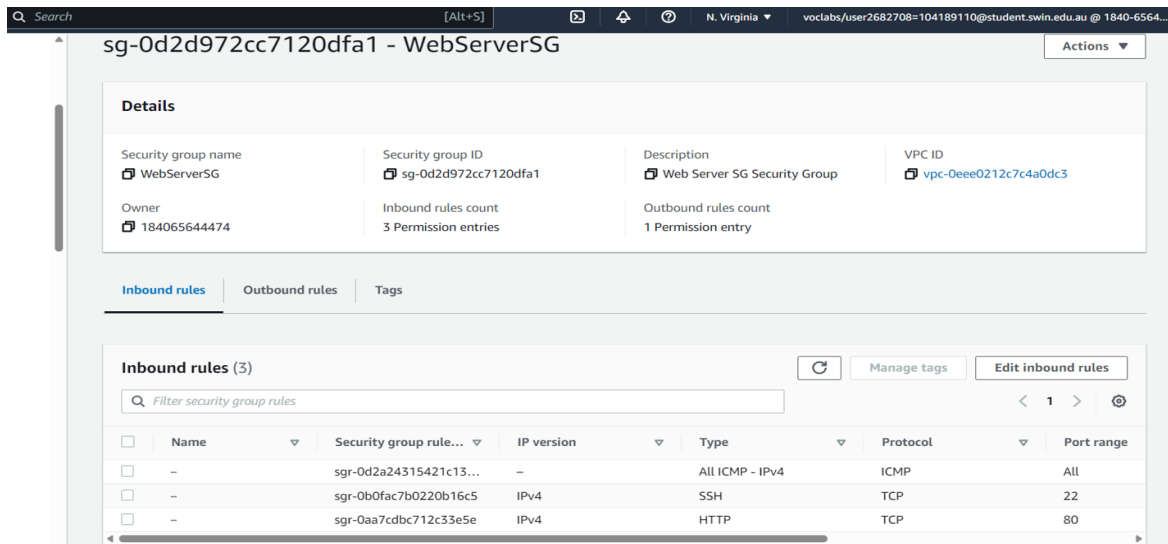


Fig 1.6 security group 2 WebServerSG

VPC > Security Groups > sg-054df3773f7b3159b - DBServerSG

sg-054df3773f7b3159b - DBServerSG Actions ▾

Details

Security group name DBServerSG	Security group ID sg-054df3773f7b3159b	Description DB Server SG Security Group	VPC ID vpc-0eee0212c7c4a0dc3
Owner 184065644474	Inbound rules count 1 Permission entry	Outbound rules count 1 Permission entry	

Inbound rules

Outbound rules

Tags

Inbound rules (1/1)

Manage tags
Edit inbound rules

<input checked="" type="checkbox"/>	Name ▾	Security group rule... ▾	IP version ▾	Type ▾	Protocol ▾	Port range
<input checked="" type="checkbox"/>	-	sgr-05abcfd5fb3a5a69	-	MySQL/Aurora	TCP	3306

Fig 1.7 security group 3 DBserversg

Created EC2 Virtual Machines one as Bastion/Web server Instance and the other Test Instance

[Alt+S] Connect Instance state ▾ Actions ▾ Launch instances ▾

Find instance by attribute or tag (case-sensitive)

Instance state = running Clear filters < 1 >

<input type="checkbox"/>	Name ▾	Instance ID	Instance state ▾	Instance type ▾	Status check	Alarm status	Availability Zone ▾	Public IP
<input type="checkbox"/>	Test-Instance	i-0d227f3807b87d4a4	Running	t2.micro	2/2 checks passed	No alarms +	us-east-1b	-
<input type="checkbox"/>	Bastion instance	i-04d98a605c559e426	Running	t2.micro	2/2 checks passed	No alarms +	us-east-1b	ec2-18-2

Fig 1.8 EC2 Instances

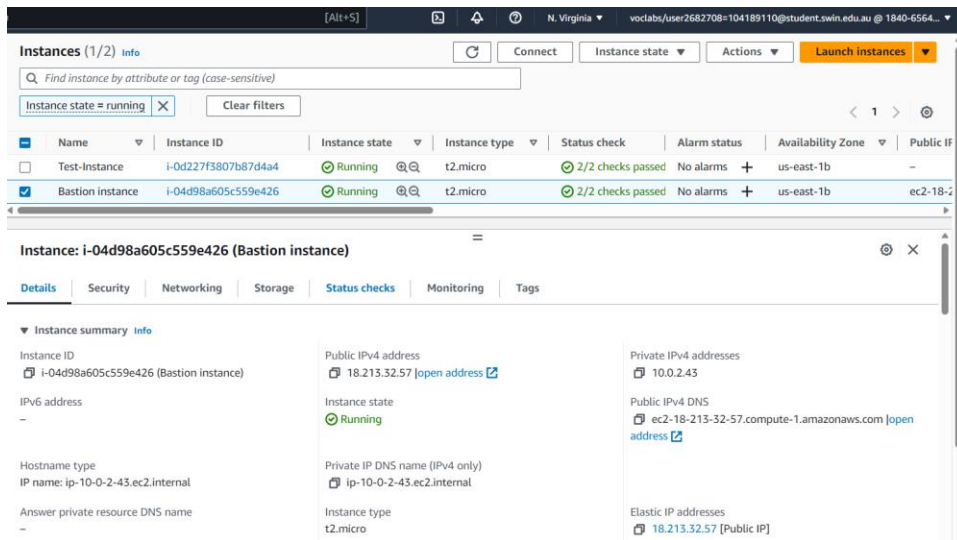


Fig 1.9 Bastion Instance

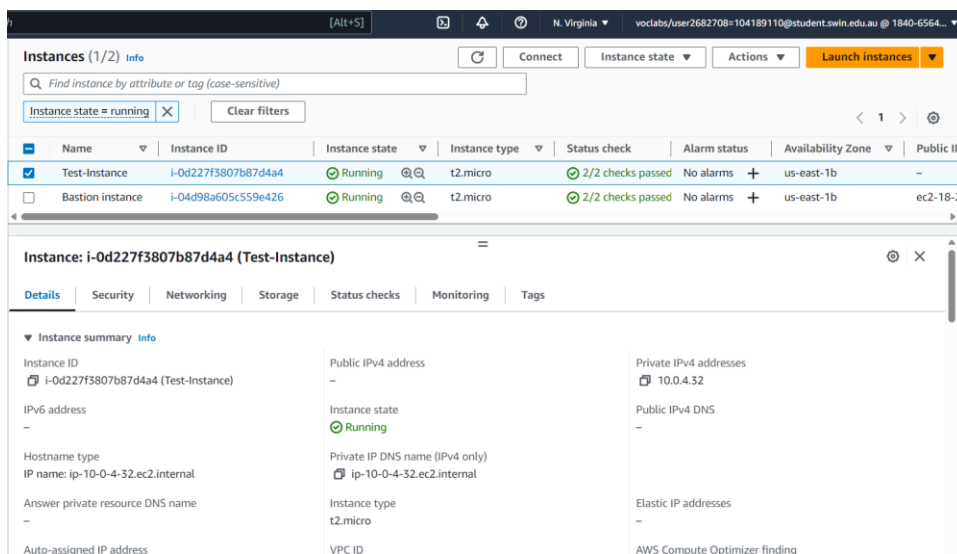


Fig 1.10 Test Instance

Created and attached Elastic IP address so that it won't change every time

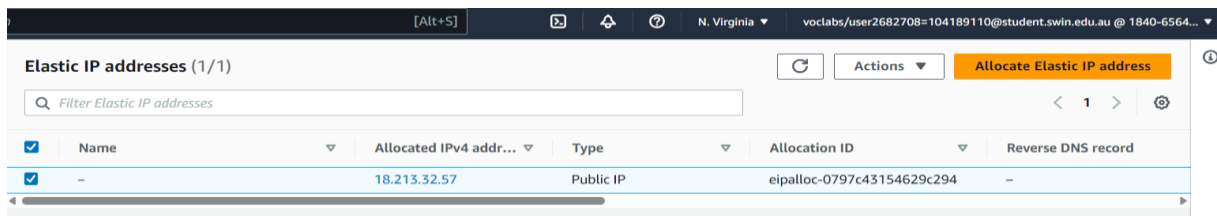


Fig 2.1 Elastic IP

Pinged the Bastion to test instance and vice versa

The screenshot shows the AWS Management Console interface. At the top, there's a search bar and buttons for 'Connect', 'Instance state', 'Actions', and 'Launch instances'. Below this is a table of instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
Test-Instance	i-0d227f3807b87d4a4	Running	t2.micro	2/2 checks passed	0 in alarm	us-east-1b	-
Bastion instance	i-04d98a605c559e426	Running	t2.micro	2/2 checks passed	0 in alarm	us-east-1b	ec2-18-2...

Below the table, the details for 'Instance: i-0d227f3807b87d4a4 (Test-Instance)' are shown. A terminal window is open, displaying the command `ping 10.0.4.32` and its output, which shows successful ping results to the bastion instance's private IP address.

Fig 2.2 ping from test to bastion

The screenshot shows the AWS Management Console interface. At the top, there's a search bar and buttons for 'Connect', 'Instance state', 'Actions', and 'Launch instances'. Below this is a table of instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
Test-Instance	i-0d227f3807b87d4a4	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b	-
Bastion instance	i-04d98a605c559e426	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b	ec2-18-2...

Below the table, the details for 'Instance: i-04d98a605c559e426 (Bastion instance)' are shown. A terminal window is open, displaying the command `ping 10.0.4.32` and its output, which shows successful ping results to the test instance's private IP address.

Fig 2.3 ping from bastion to test

Creating RDS Database Instance with the configs as per the assignment

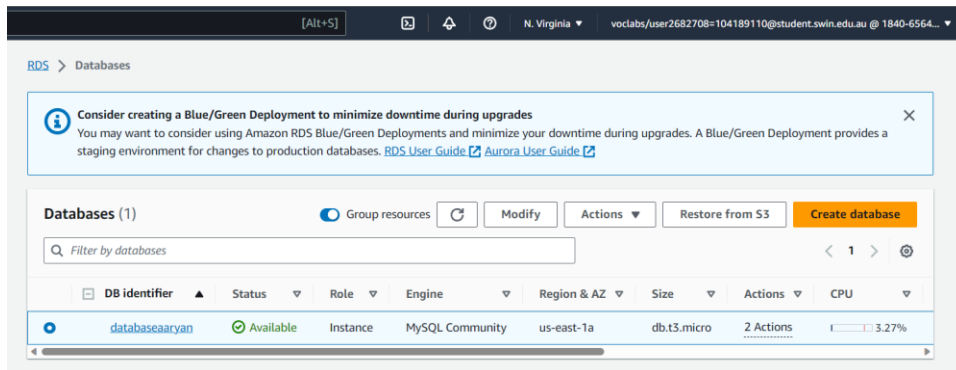


Fig 2.4 creation of RDS

Connecting to PHP MyAdmin

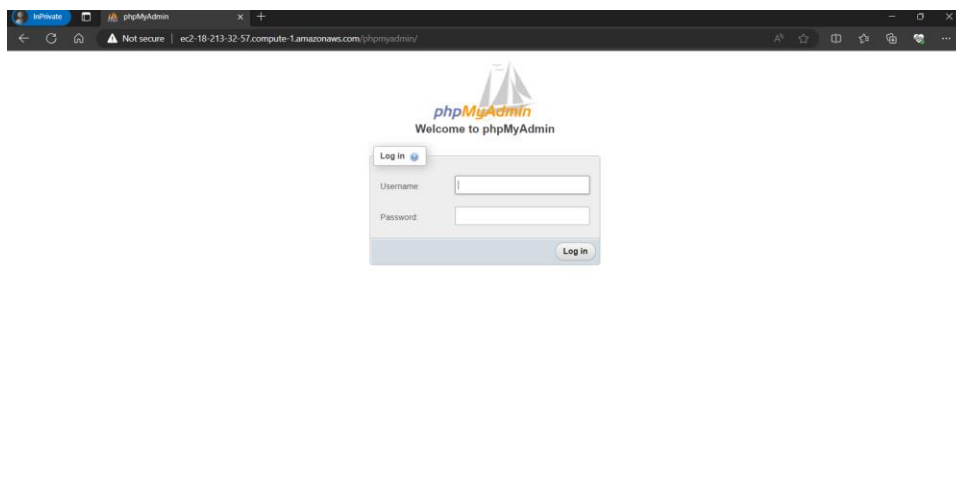


Fig 2.5 login page

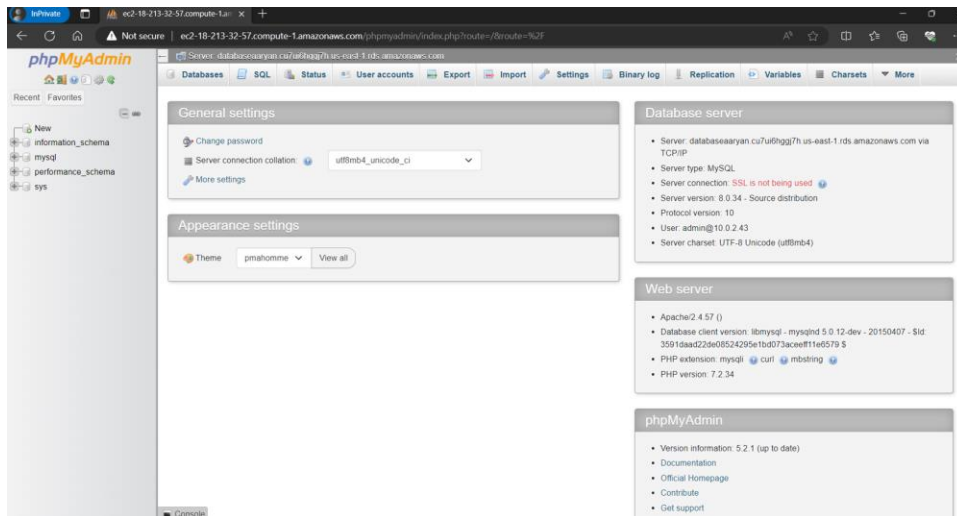


Fig 2.6 After logging in

Creating NetworkACL as additional layer security with necessary inbound rules

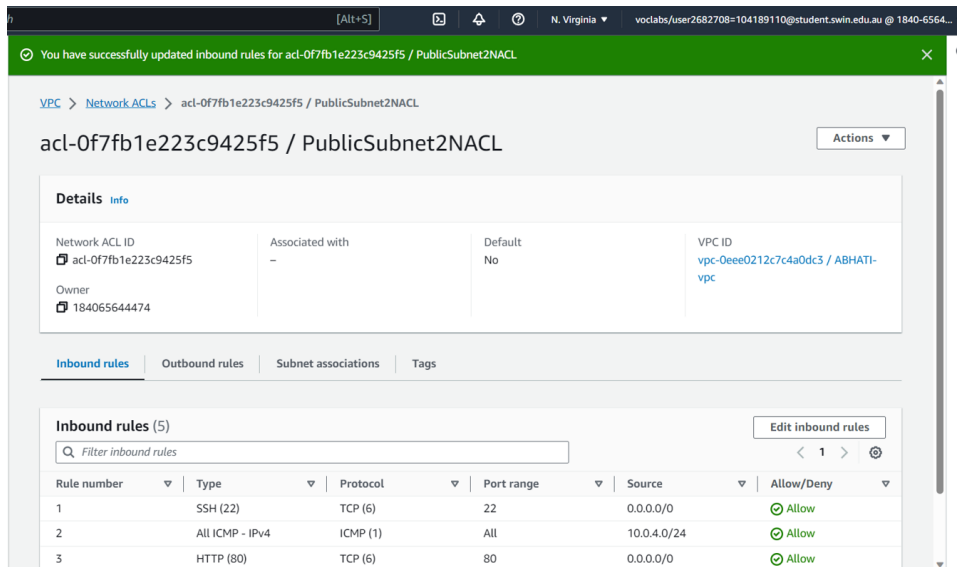


Fig 2.7 network ACL

Creating a database in PHPMyAdmin with the required configs

The screenshot shows the PHPMyAdmin interface with the 'Structure' tab selected for a table named 'photos'. The table structure is defined as follows:

Name	Type	Length/Values	Default	Collation	Attributes	Null	Index	A	Comments
Title	VARCHAR	255	None			<input type="checkbox"/>	---	<input type="checkbox"/>	
Description	VARCHAR	255	None			<input type="checkbox"/>	---	<input type="checkbox"/>	
Creationdate	DATE		None			<input type="checkbox"/>	---	<input type="checkbox"/>	
Keywords	VARCHAR	255	None			<input type="checkbox"/>	---	<input type="checkbox"/>	
Keyword	VARCHAR	255	None			<input type="checkbox"/>	---	<input type="checkbox"/>	

Below the table structure, there are fields for 'Table comments', 'Collation', and 'Storage Engine' (set to InnoDB). There is also a 'PARTITION definition' section with fields for 'Partition by' and 'Partitions'.

Fig 2.8 creating the columns

The screenshot shows the PHPMyAdmin interface with the 'Table structure' tab selected for a table named 'photos'. The table structure is displayed as follows:

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/>	1 Title	varchar(255)	utf8mb4_0900_ai_ci		No	None			Change Drop More
<input type="checkbox"/>	2 Description	varchar(255)	utf8mb4_0900_ai_ci		No	None			Change Drop More
<input type="checkbox"/>	3 Creationdate	date			No	None			Change Drop More
<input type="checkbox"/>	4 Keywords	varchar(255)	utf8mb4_0900_ai_ci		No	None			Change Drop More
<input type="checkbox"/>	5 Keyword	varchar(255)	utf8mb4_0900_ai_ci		No	None			Change Drop More

Below the table structure, there are options to 'Check all', 'With selected', 'Browse', 'Change', 'Drop', 'Primary', 'Unique', 'Index', 'Spatial', and 'Fulltext'. There are also links for 'Print', 'Move columns', and 'Normalize'. At the bottom, there is a field to 'Add' a new column, with a dropdown menu set to 'after Keyword' and a 'Go' button.

Fig 2.9 table columns created

Photo storage S3 bucket with manually uploaded photos with the required specifications

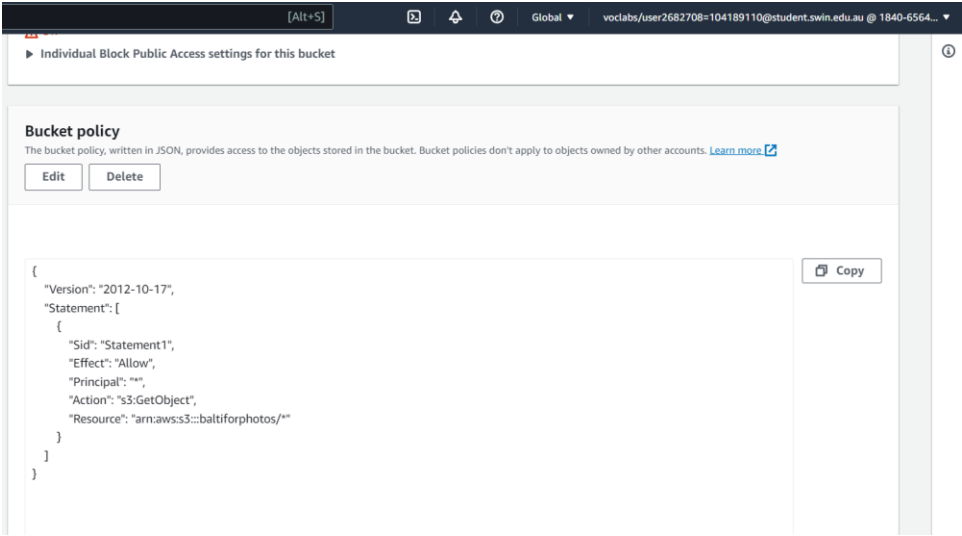


Fig 2.10 editing the bucket policy

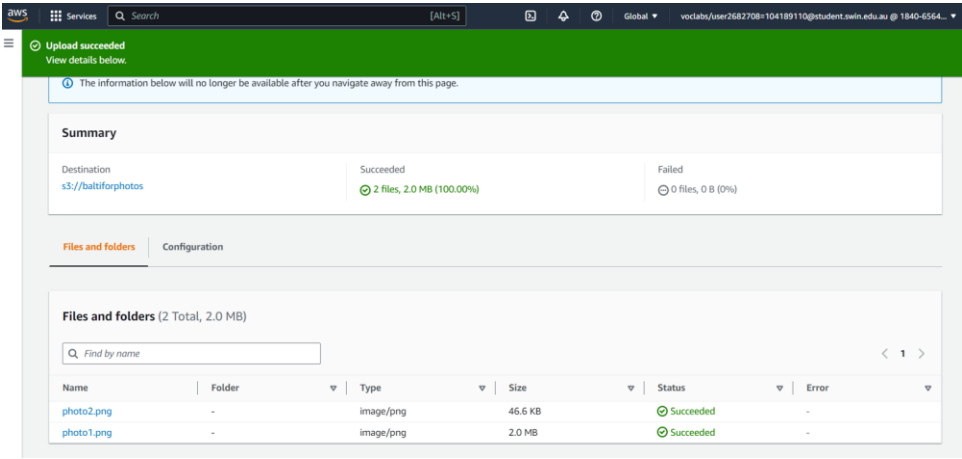


Fig 3.1 successful upload of the 2 photos into S3 bucket

Putting in meta-data Photo meta-data in RDS Database

phpMyAdmin

Server: database-1.amazonaws.com:3306

Database: photoalbums

Table: photos

Column	Type	Function	Null	Value
Title	varchar(255)			photo1
Description	varchar(255)			This a airport zone
Creationdate	date			2023-09-15
Keywords	varchar(255)			airport, map

Fig 3.2 Creation of and input of meta data for photo 1

phpMyAdmin

Server: database-1.amazonaws.com:3306

Database: photoalbums

Table: photos

Column	Type	Function	Null	Value
Title	varchar(255)			Photo2
Description	varchar(255)			splashkit haapy face
Creationdate	date			2023-09-15
Keywords	varchar(255)			face, nose

Fig 3.3 Creation of and input of meta data for photo 1

Photo 1

Checked using the link --- (<https://baltiforphotos.s3.amazonaws.com/photo1.png>)

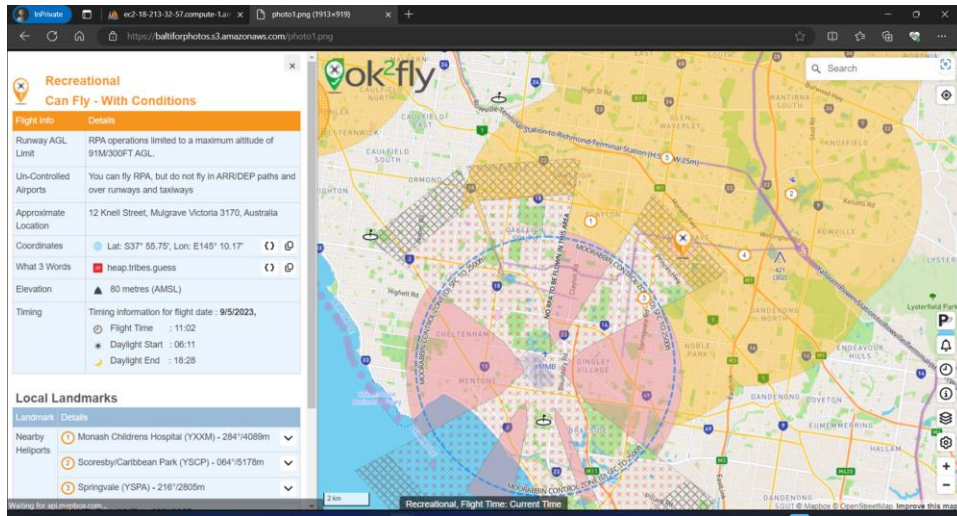


Fig 3.4 photo of airport hosted on S3 bucket

Photo 2

Checked using the link --- (<https://baltiforphotos.s3.amazonaws.com/photo2.png>)

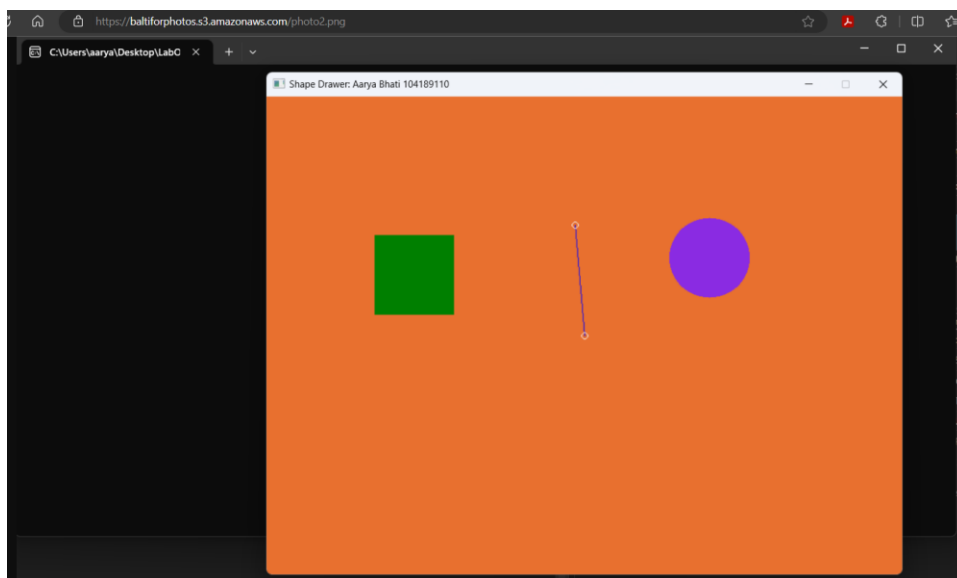
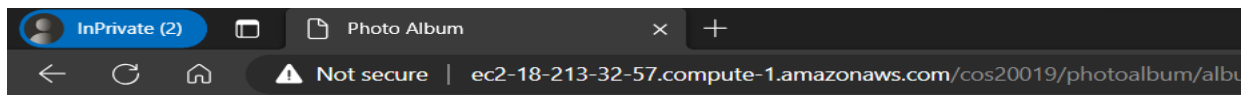


Fig 3.5 photo 2 hosted on S3 bucket

Photo Album website functionality using website and the showing of the related metadata displayed
(<http://ec2-18-213-32-57.compute-1.amazonaws.com/cos20019/photoalbum/album.php>)



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Tutorial session: Friday_4:30PM

Uploaded photos:



Photo	Name	Description	Creation date	Keywords
	Photo1	airport atc	2023-09-15	airport, map
	Photo2	splashkit haapy face	2023-09-15	face, nose

Fig 3.6 showing website with pho and the respective metadata

Challenges faced

1. Configuration of VPC subnets: this required VPC subnets connections with a public route table, which is connected to an internet gateway. To fulfill the assignment requirements.
2. The proper order of steps to take when creating an RDS subnet was another problem. An RDS subnet needed to be setup prior to installing the RDS itself. An in-depth knowledge of the dependencies was necessary for this, along with rigorous preparation.
3. Another issue was determining the right sequence of actions to do while setting up an RDS subnet. It was necessary to set up an RDS subnet before installing the RDS itself. This required a thorough understanding of the dependencies, as well as meticulous planning.

