

# COS20019 - Cloud Computing Architecture

## Assignment 1 - Part B

### Creating and deploying Photo Album website onto a simple

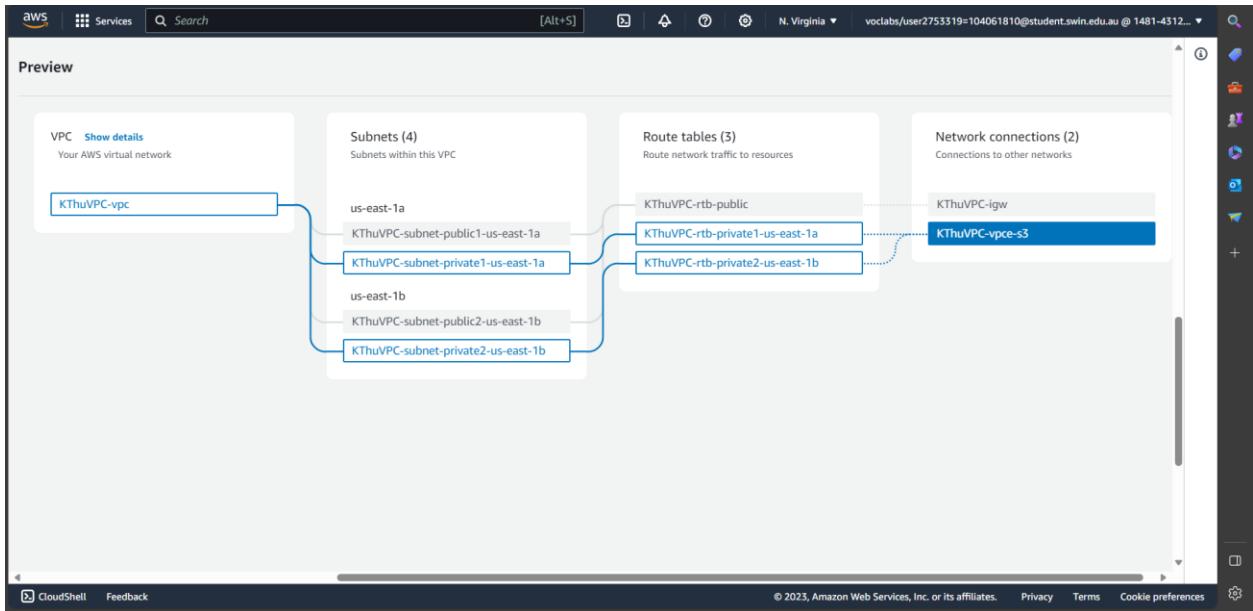
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#### 1.1 Create VPC name and set up some features as requirement of assignment

The screenshot shows the AWS VPC settings page. On the left, the configuration pane includes fields for Name tag auto-generation (set to KThuVPC), IPv4 CIDR block (10.0.0.0/16), and Tenancy (Default). Under Number of Availability Zones (AZs), it specifies 2 AZs. On the right, the Preview pane shows a hierarchical tree of resources. The VPC node 'KThuVPC-vpc' has four Subnets under 'us-east-1a' and 'us-east-1b'. Each subnet is associated with three Route tables: 'KThuVPC-rtb-p', 'KThuVPC-rtb-p', and 'KThuVPC-rtb-p'. The entire configuration is set for the 'us-east-1b' region.

This screenshot shows the same VPC configuration as above, but with a different number of public subnets. In the configuration pane, the 'Number of public subnets' field is set to 2. The preview pane shows the VPC 'KThuVPC-vpc' with four public subnets ('us-east-1a' and 'us-east-1b', each containing two subnets) and three route tables per subnet, all associated with the 'us-east-1b' region.



## 1.2 – Create security groups and set up some features as requirement of assignment

The screenshot shows the 'Create security group' form in the AWS VPC service. The 'Basic details' section includes:

- Security group name:** TestInstanceSG
- Description:** Test Instance
- VPC:** vpc-0ccb59cb62228bb59 (default)
- Inbound Rules:** This security group has no inbound rules.

At the bottom, there is a 'Add rule' button.

The screenshot shows two AWS VPC configurations side-by-side.

**Top Configuration:**

- VPC Info:** Test Instance, vpc-00013845d5ec0a845
- Inbound rules:** Type: All traffic, Protocol: All, Port range: All, Source: Anywhere (0.0.0.0/0). A warning message states: "⚠ Rules with source of 0.0.0.0/0 or ::/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only."
- Outbound rules:** Type: All traffic, Protocol: All, Port range: All, Destination: Custom, Description: optional.

**Bottom Configuration:**

- Create security group:** Security group name: WebServerSG, Description: Web Server, VPC: vpc-00013845d5ec0a845.
- Inbound rules:** This security group has no inbound rules.

Both configurations are in the N. Virginia region, with the bottom one showing the URL vocabs/user2753319=104061810@student.swin.edu.au @ 1481-4312... and the top one showing vocabs/user2753319=104061810@student.swin.edu.au @ 1481-4312... Both include CloudShell and Feedback links at the bottom.

The screenshot shows two side-by-side AWS management console pages.

**VPC Info:** The top page displays the VPC settings for a specific VPC. It includes a search bar for 'vpc-00013845d5ec0a845' and a table for 'Inbound rules'. The table has columns for Type, Protocol, Port range, Source, and Description. Three rules are listed:

- Type: HTTP, Protocol: TCP, Port range: 80, Source: Anywhere (0.0.0.0/0), Description: (empty)
- Type: SSH, Protocol: TCP, Port range: 22, Source: Anywhere (0.0.0.0/0), Description: (empty)
- Type: All ICMP - IPv4, Protocol: ICMP, Port range: All, Source: Custom (sg-0d93edc43300878d9), Description: (empty)

A yellow warning message at the bottom states: "Rules with source of 0.0.0.0/0 or ::/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only."

**Security Group Inbound Rules:** The bottom page shows the configuration for a security group named 'DB Server'. It includes a search bar for 'vpc-00013845d5ec0a845' and an 'Inbound rules' section. The table has columns for Type, Protocol, Port range, Source, and Description. One rule is listed:

- Type: MySQL/Aurora, Protocol: TCP, Port range: 3306, Source: Custom (sg-06d0354ad6903b556), Description: (empty)

Below this is an 'Outbound rules' section with a table showing one rule:

- Type: All traffic, Protocol: All, Port range: All, Destination: Anywhere (0.0.0.0/0), Description: (empty)

### 1.3 – EC2 virtual machine

create two EC2 instances( a test instance and a bastion instance) and set up some features as requirements of assignment.

The screenshot shows the AWS EC2 Instances page. The left sidebar includes options like EC2 Dashboard, EC2 Global View, Events, Instances (selected), Images, and Elastic Block Store. The main content area displays a table of instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
My Web Server	i-0b7c760ac63379c94	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	ec2-3-84-
Bastion instance	i-0e696b1c2b3775ed9	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	-
Test instance	i-0dac660d52d1216b0	Pending	t2.micro	-	No alarms	us-east-1a	-

A modal window titled "Select an instance" is open at the bottom.

## 1.4 – RDS database instance

### Create RDS DB as requirements of assignment

The screenshot shows the AWS RDS Databases page. The left sidebar includes options like Dashboard, Databases (selected), 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 (New), Events, and Event subscriptions.

A modal window titled "Creating database assignment1b-db" is open, stating: "Your database might take a few minutes to launch. You can use settings from assignment1b-db to simplify configuration of suggested database add-ons while we finish creating your DB for you."

The main content area shows a table of databases:

DB identifier	Status	Role	Engine	Region & AZ	Size	Actions	CPU	Current a
assignment1b-db	Creating	Instance	MySQL Community	us-east-1a	db.t3.micro	-	-	-

install phpMyAdmin (a web-based MySQL administration tool) on EC2 web server instance and manage database through phpMyAdmin's UI

The screenshot shows a web browser with two tabs. The left tab is a course dashboard from Swinburne Instructure, and the right tab is a terminal window showing the command line process of installing phpMyAdmin on an EC2 instance.

**Terminal Output:**

```
elInterface.php
inflate: phpMyAdmin-4.8.2-english/vendor/twig/twig/src/TokenParser/UseTokenParser.php
inflate: phpMyAdmin-4.8.2-english/vendor/twig/twig/src/TokenParser/WithTokenParser.php
inflate: phpMyAdmin-4.8.2-english/vendor/twig/twig/src/TokenStream.php
inflate: phpMyAdmin-4.8.2-english/vendor/twig/twig/src/TwigFilter.php
inflate: phpMyAdmin-4.8.2-english/vendor/twig/twig/src/TwigFunction.php
inflate: phpMyAdmin-4.8.2-english/vendor/twig/twig/src/TwigTest.php
creating: phpMyAdmin-4.8.2-english/vendor/twig/twig/src/Util/
inflate: phpMyAdmin-4.8.2-english/vendor/twig/twig/src/Util/DeprecationCollection.php
inflate: phpMyAdmin-4.8.2-english/vendor/twig/twig/src/Util/TemplateDirIterator.php
inflate: phpMyAdmin-4.8.2-english/vendor/twig/twig/src/Util/version_check.php
inflate: phpMyAdmin-4.8.2-english/vendor/twig/twig/src/View/create.php
inflate: phpMyAdmin-4.8.2-english/vendor/twig/twig/src/View/operations.php
inflate: phpMyAdmin-4.8.2-english/vendor/twig/twig/src/View/yarn.lock
finishing deferred symbolic links:
phpMyAdmin-4.8.2-english/vendor/bin/highlight-query -> ../phpmyadmin/sql-parser/bin/highlight-query
phpMyAdmin-4.8.2-english/vendor/bin/lint-query -> ../phpmyadmin/sql-parser/bin/lint-query
(ec2-user@ip-10-0-2-182 ~)$
$cfg['Servers'][$i]['host'] = 'your_rds_endpoint';
```

**Task 3. Access phpMyAdmin from your local machine:**

- From a browser on your local machine, visit <http://your-ec2-public-dns.compute.amazonaws.com/phpmyadmin/>
- Enter the username and password of your DB.

**File Transfer:**

The WinSCP interface shows files being transferred between a local desktop (C:\Users\nhan\Desktop\1a) and the EC2 instance's /var/www/html directory.

Name	Size	Type	Changed
..		Parent directory	28-09
photolookup.php	1 KB	PHP File	28-09
photouploader.php	2 KB	PHP File	28-09
Name	Size	Changed	
..		15-10-2023 11:58:15 AM	
phpmyadmin		21-06-2018 8:12:14 PM	
phpMyAdmin-4.8.2-en...	6,232 KB	22-06-2018 1:21:25 AM	
phpinfo.php	1 KB	15-10-2023 11:58:24 AM	

## Rename config.sample.inc.php to config.inc.php

The screenshot shows a web browser window with a course navigation bar on the left. The main content area displays a "Supporting materials" section with instructions for installing phpMyAdmin. Below this is a WinSCP interface showing a file transfer between a local desktop and a remote server at `ec2-user@44.194.114.140`. The local desktop folder is `C:\Users\phanh\Desktop\1a\`, and the remote server folder is `/var/www/html/phpmyadmin/`. A file named `config.sample.inc.php` is selected in the local folder, while a file named `config.inc.php` exists in the remote folder.

Login to phpMyAdmin using username and password created before

The screenshot shows the "Welcome to phpMyAdmin" page. At the top, there is a warning message: "⚠ Not secure | ec2-44-194-114-140.compute-1.amazonaws.com/phpmyadmin/". Below the header is the phpMyAdmin logo and the text "Welcome to phpMyAdmin". A "Log in" form is centered on the page, containing fields for "Username:" and "Password:", both currently empty. A "Go" button is located at the bottom right of the form.

Create the database as well as a new table in phpMyadmin using the following SQL commands.

The screenshot displays two main windows side-by-side:

**Top Window (phpMyAdmin):**

- Shows the database structure with databases like New, information\_schema, mysql, performance\_schema, and sys.
- A SQL query editor window containing the following SQL code:

```

1 CREATE DATABASE IF NOT EXISTS assignment1b;
2 USE assignment1b;
3 CREATE TABLE photos (
4     photo_title VARCHAR(255),
5     description VARCHAR(255),
6     creation_date DATE,
7     keywords VARCHAR(255),
8     s3_reference VARCHAR(255)
9 );

```

- Buttons at the bottom include Clear, Format, Get auto-saved query, Bind parameters, Delimiter, Show this query here again, Retain query box, Rollback when finished, Enable foreign key checks, and Go.

**Bottom Window (AWS Network ACLs):**

- The title bar shows "You have successfully updated outbound rules for acl-034028c544e7737c0 / publicsubnet2NAACL".
- The "Network ACLs (1/5)" table lists five existing Network ACLs and one selected one:

Name	Network ACL ID	Associated with	Default	VPC ID	Inbound rules count	Outbound rules count
ad-0204bdc03d6e9fdad	3 Subnets		Yes	vpc-00013845d5ec0a845 / KThuVPC-vpc	2 Inbound rules	2 Outbound rules
PublicSubnet2NAACL	ad-09b7ad0760d04055d	subnet-082ef953b979668bf / KThuVPC-subnet...	No	vpc-00013845d5ec0a845 / KThuVPC-vpc	7 Inbound rules	2 Outbound rules
-	ad-0c00840656eff63ea	4 Subnets	Yes	vpc-091e9818547f11c2c / kthuVPC-vpc	2 Inbound rules	2 Outbound rules
-	ad-0c534ea5287017855	6 Subnets	Yes	vpc-0ccb59cb6222bb59	2 Inbound rules	2 Outbound rules
<b>publicsubnet2NAACL</b>	<b>ad-034028c544e7737c0</b>	-	No	<b>vpc-091e9818547f11c2c / kthuVPC-vpc</b>	<b>7 Inbound rules</b>	<b>2 Outbound rules</b>

- The "Inbound Rules" table shows the configuration for the selected Network ACL:

Rule number	Type	Protocol	Port range	Source	Allow/Deny
1	SSH (22)	TCP (6)	22	0.0.0.0/0	Allow
2	All ICMP - IPv4	ICMP (1)	All	10.0.4.0/24	Allow
3	HTTP (80)	TCP (6)	80	0.0.0.0/0	Allow
4	HTTPS (443)	TCP (6)	443	0.0.0.0/0	Allow
5	All TCP	TCP (6)	All	10.0.3.0/24	Allow
6	All TCP	TCP (6)	All	10.0.4.0/24	Allow
*	All traffic	All	All	0.0.0.0/0	Deny

## Create a new subnet group named DBSubnetGroup in my VPC.

The screenshot shows the AWS RDS Subnet Groups page. On the left, there's a sidebar with various AWS services like EC2, Lambda, and CloudWatch. Under the RDS section, the 'Subnet groups' option is selected. The main area displays a table titled 'Subnet groups (3)'. The table has columns for Name, Description, Status, and VPC. The first row, 'dbsubnetgroup', is described as a 'Private subnet' and is in 'Complete' status, associated with 'vpc-091e9818547f11c2c'. The other two rows are also in 'Complete' status and associated with different VPCs.

The screenshot shows the AWS VPC Network ACLs page. The left sidebar includes options for VPC dashboard, EC2 Global View, and various VPC-related settings like Subnets, Route tables, and Internet gateways. Under the 'Security' section, 'Network ACLs' is selected. A success message at the top says 'You have successfully updated subnet associations for acl-034028c544e7737c0 / publicsubnet2NACL.' Below this, the 'Details' tab is active for the network ACL 'acl-034028c544e7737c0 / publicsubnet2NACL'. The 'Details' section shows the Network ACL ID, its association with a specific subnet, and the VPC ID. The 'Inbound rules' tab is selected, displaying a table of 7 rules. The first six rules allow traffic from 0.0.0.0/0 to 10.0.4.0/24 on ports 22, ICMP, TCP 80, 443, and TCP 6 respectively. The last rule denies all traffic from All to All.

The screenshot shows the AWS VPC Network ACLs interface. The user is editing the subnet associations for a specific Network ACL. In the 'Available subnets' table, several subnets are listed with their details like Name, Subnet ID, Associated with, Availability Zone, and IP CIDR. One subnet, 'kthuVPC-subnet-private2-us-east-1b', is selected and highlighted with a blue border. In the 'Selected subnets' section, this subnet is listed. At the bottom right, there are 'Cancel' and 'Save changes' buttons.

Name	Subnet ID	Associated with	Availability Zone	IPv4 CIDR	IPv6 CIDR
kthuVPC-subnet-private1-us-east-1a	subnet-09d3ec42b48106f62	acl-0c8084065eeef63ea	us-east-1a	10.0.3.0/24	-
kthuVPC-subnet-public2-us-east-1b	subnet-07d6c6bd59f52469b	acl-0c8084065eeef63ea	us-east-1b	10.0.2.0/24	-
kthuVPC-subnet-private2-us-east-1b	subnet-0541d75e7556c37d1	acl-0c8084065eeef63ea	us-east-1b	10.0.4.0/24	-
kthuVPC-subnet-public1-us-east-1a	subnet-0a96bf627b70aed3b	acl-034028c544e7737c0 / publicsub...	us-east-1a	10.0.1.0/24	-

Create an S3 bucket to store photos. Manually upload some photos onto S3 bucket that just created

The screenshot shows the AWS Amazon S3 Bucket Policy editor. A success message at the top indicates that the policy has been edited successfully. The policy document is displayed in JSON format, allowing the user to view and edit the access rules. A 'Copy' button is available to copy the policy code. The left sidebar provides navigation links for Buckets, Access Points, Object Lambda Access Points, Multi-Region Access Points, Batch Operations, IAM Access Analyzer for S3, Block Public Access settings for this account, Storage Lens, Dashboards, and AWS Organizations settings. A Feature spotlight section is also present.

```
[{"Version": "2012-10-17", "Statement": [ { "Effect": "Allow", "Principal": "*", "Action": "S3:GetObject", "Resource": "arn:aws:s3:::kthubucket/*" } ]}
```

The screenshot shows two separate sessions of the AWS S3 console.

**Session 1: Block Public Access Settings**

- The top navigation bar includes the AWS logo, Services, a search bar, and a user account section.
- The left sidebar shows the "Amazon S3" service and a "Buckets" section with various options like Object Lambda Access Points, Multi-Region Access Points, Batch Operations, and IAM Access Analyzer for S3.
- The main content area displays a green success message: "Successfully edited Block Public Access settings for this bucket."
- A "Permissions overview" section shows "Access" and "Bucket and objects not public".
- A "Block public access (bucket settings)" section indicates "Block all public access" is set to "Off".
- Below this, a "Bucket policy" section shows a JSON policy snippet and a note about bucket policies not applying to other accounts.
- At the bottom, there are "Edit" and "Delete" buttons.

**Session 2: File Upload Status**

- The top navigation bar includes the AWS logo, Services, a search bar, and a user account section.
- The left sidebar shows the "Amazon S3" service and a "Files and folders" section.
- The main content area shows a green success message: "Upload succeeded. View details below."
- A "Summary" section shows the destination bucket as "s3://kthubucket" with 3 files uploaded (1.1 MB) and 0 failed files (0 B).
- An "Edit" button is present at the top of the summary section.
- The "Files and folders" tab is selected, showing a table of uploaded files:

Name	Folder	Type	Size	Status	Error
sunset-569093_1280.jpg	-	image/jpeg	446.6 KB	Succeeded	-
eiffel-tower-3349075_128...	-	image/jpeg	284.8 KB	Succeeded	-
funes-4984899_1280.jpg	-	image/jpeg	388.7 KB	Succeeded	-

Insert metadata into the database using SQL commands and Data records in the database.

Not secure | ec2-44-194-114-140.compute-1.amazonaws.com/phpmyadmin/sql.php?db=assignment1b&table=photos&pos=0

phpMyAdmin

Recent: Favorites

New

assignment1b

New

photos

information\_schema

mysql

Events

Functions

Procedures

Tables

Type to filter these. Enter to se x

New

columns\_priv

component

db

default\_roles

engine\_cost

func

general\_log

global\_grants

gtid\_executed

help\_category

help\_keyword

help\_relation

help\_topic

innodb\_index\_stats

innodb\_table\_stats

password\_history

plugin

procs\_priv

proxies\_priv

Browse Structure SQL Search Insert Export Import Privileges Operations Triggers

Current selection does not contain a unique column. Grid edit, checkbox, Edit, Copy and Delete features are not available.

Showing rows 0 - 2 (3 total). Query took 0.0006 seconds. [photo\_title: ITALY... - PARIS...]

SELECT \* FROM `photos` ORDER BY `photo\_title` ASC

Show all Number of rows: 25 Filter rows: Search this table

+ Options photo\_title 1 description creation\_date keywords s3\_reference

Italy	forest	2018-01-01	italian	https://kthubucket.s3.amazonaws.com/funes-4984899...
New York	sunset	2017-01-01	sun	https://kthubucket.s3.amazonaws.com/sunset-569093...
Paris	eiffel	2022-01-01	paris	https://kthubucket.s3.amazonaws.com/eiffel-tower-3...

Show all Number of rows: 25 Filter rows: Search this table

Query results operations

Print Copy to clipboard Export Display chart Create view

Console

The screenshot shows the phpMyAdmin interface for a MySQL database named 'assignment1b'. The 'photos' table is selected, displaying three rows of data. The columns are 'photo\_title', 'description', 'creation\_date', 'keywords', and 's3\_reference'. The data includes entries for Italy (forest), New York (sunset), and Paris (eiffel). Below the table, there are options to print, copy to clipboard, export, display a chart, or create a view. On the left, a sidebar lists various MySQL schema objects like 'Events', 'Functions', 'Procedures', and 'Tables'.

File Home Insert Draw Design Layout References Mailings Review View Help

Comments Editing Share

photoalbum – ec2-user@44.194.114.140 – WinSCP

Clipboard

Font

Paste

Upload Edit Properties Local Mark Files Commands Tabs Options Remote Help

C:\Users\than\Desktop\photoalbum\_v3.0.photoalbum\_v3.0

Name	Size	Type	Changed
...		Parent directory	15-10-10
album.php	2 KB	PHP File	15-10-10
constants.php	3 KB	PHP File	15-10-10
defaultstyle.css	1 KB	CSS Source File	15-10-10
mydb.php	2 KB	PHP File	15-10-10
photo.php	2 KB	PHP File	15-10-10

Download Edit Properties Local Mark Files Commands Tabs Options Remote Help

/var/www/html/cos2019/photoalbum/

Name	Size	Changed
...		15-10-2023 5:17:35 PM
photo.php	2 KB	15-10-2023 5:06:09 PM
mydb.php	2 KB	15-10-2023 5:06:09 PM
defaultstyle.css	1 KB	15-10-2023 5:06:09 PM
constants.php	3 KB	15-10-2023 5:10:46 PM
album.php	2 KB	15-10-2023 5:06:09 PM

Page 15 of 15 34 words English (United States) Text Predictions: On Accessibility:

The screenshot shows the WinSCP interface during a file transfer session. The left pane shows a local directory structure on the desktop, and the right pane shows files in an S3 bucket at 'var/www/html/cos2019/photoalbum/'. The 'photoalbum' folder from the local desktop is being transferred to the S3 bucket. The status bar at the bottom indicates the session is connected to 'ec2-user@44.194.114.140'.

This my photos that uploaded on my web server.

Student name: Tran Kim Thu  
Student ID: 104061810  
Tutorial session: Saturday 9:00 AM

**Uploaded photos:**

Photo	Name	Description	Creation date	Keywords
	Paris	eiffel	2022-01-01	paris
	Italy	forest	2018-01-01	italian
	New York	sunset	2017-01-01	sun

Ping from TestInstance to WebServer

The screenshot shows the AWS CloudShell interface. A terminal window is open, displaying the following command and its output:

```
[ec2-user@ip-10-0-4-111:~] $ ping 10.0.2.182
PING 10.0.2.182 (10.0.2.182) 56(84) bytes of data.
Answering PING 10.0.2.182 (10.0.2.182) 56(84) bytes of data.
```

The terminal also shows system logs and other instance details. The AWS CloudShell interface includes a sidebar with navigation links like EC2 Dashboard, EC2 Global View, Events, Instances, Images, Elastic Block Store, Network & Security, and CloudShell Feedback.