



ACA Module 9 Challenge Lab

COS 20019- Cloud Computing Architecture

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5/7/2023

This is all my step to finish ACA Module 9 Challenge Lab, each screenshot include requirements and explanations.

Answering questions about the lab

Module 9 Challenge Lab - Creating a Scalable and Highly Available Environment for the Cafe

Due No Due Date Points 100 Submitting an external tool

Answering questions about the lab

Answers will be recorded when you choose the blue **Submit** button at the end of the lab.

6. Access the questions in this lab.

- Choose the Details menu, and choose Show.
- Choose the **Access the multiple choice questions** link that appears at the bottom of the page.

7. In the page that you loaded, answer the questions:

- Question 1:** Which ports are open in the *CafeSG* security group?
- Question 2:** Can you connect from the internet to instances in *Public Subnet 1*?
- Question 3:** Should an instance in *Private Subnet 1* be able to reach the internet?
- Question 4:** Should an instance in *Private Subnet 2* be able to reach the internet?
- Question 5:** Can you connect to the *CafeWebAppServer* instance from the internet?
- Question 6:** What is the name of the Amazon Machine Image (AMI)?

Task 2: Creating a NAT gateway for the second Availability

Grades

Item	Score
[Answer 01]	1/1
[Answer 02]	1/1
[Answer 03]	1/1
[Answer 04]	1/1
[Answer 05]	1/1
[Answer 06]	1/1
[Task 2] NAT Gateway exists	0/5
[Task 3] Bastion Host exists	0/5

Task 2: Creating a NAT gateway for the second Availability Zone

Module 9 Challenge Lab - Creating a Scalable and Highly Available Environment for the Cafe

Due No Due Date Points 100 Submitting an external tool

Question 6: What is the name of the Amazon Machine Image (AMI)?

Task 2: Creating a NAT gateway for the second Availability Zone

To achieve high availability, the architecture must span at least two Availability Zones. However, before you launch Amazon Elastic Compute Cloud (Amazon EC2) instances for your web application servers in the second Availability Zone, you must create a NAT gateway for them. A NAT gateway will allow instances that do not have a public IP address to access the internet.

8. Create a NAT gateway in the *Public Subnet* in the second Availability Zone.

9. Configure the network to send internet-bound traffic from instances in *Private Subnet 2* to the NAT gateway you just created.

Task 3: Creating a bastion host instance in a public subnet

In this task, you will create a bastion host in a public subnet. In later tasks, you will create an EC2 instance in a private subnet and connect to it from this bastion host.

10. From the *Amazon EC2 console*, create an EC2 instance in one of the public subnets of the

VPC Management Console

NAT gateway nat-0d695ea2a0c6372f5

Details

Property	Value
NAT gateway ID	nat-0d695ea2a0c6372f5
NAT gateway ARN	arn:aws:ec2:us-east-1:128556005776:natgateway/nat-0d695ea2a0c6372f5
VPC	vpc-023e7c10w0150062 / Lab VPC
State	Pending
Primary private IPv4 address	-
Created	Thursday, June 29, 2023 at 17:12:02 GMT+7

Configure the network to send internet-bound traffic from instances in Private Subnet 2 to the NAT gateway

The screenshot displays two browser windows. The left window shows the AWS Academy 'Module 9 Challenge Lab - Creating a Scalable and Highly Available Environment for the Cafe'. It includes a sidebar with navigation links like Account, Dashboard, Courses, Calendar, Inbox, History, and Help. The main content area shows 'Question 6: What is the name of the Amazon Machine Image (AMI)?' and two tasks: 'Task 2: Creating a NAT gateway for the second Availability Zone' and 'Task 3: Creating a bastion host instance in a public subnet'. The right window shows the AWS Management Console 'VPC Management Console' for the 'us-east-1' region. It displays the 'Private Route Table 2' (rtb-01116e9a6424ebfb7) configuration. The 'Routes' tab shows two routes: '0.0.0.0/0' pointing to 'nat-06b48b3e0a3a8d865' and '10.0.0.0/16' pointing to 'local'. The 'Subnet associations' tab shows the route table is associated with 'Private Subnet 2'.

Task 3: Creating a bastion host instance in a public subnet

The screenshot displays two browser windows. The left window shows the 'Module 9 Challenge Lab - Creating a Scalable and Highly Available Environment for the Cafe' on the AWS Academy platform. It highlights 'Task 3: Creating a bastion host instance in a public subnet'. The task instructions state: 'In this task, you will create a bastion host in a public subnet. In later tasks, you will create an EC2 instance in a private subnet and connect to it from this bastion host.' The criteria for the EC2 instance are: Name: Bastion Host, Amazon Machine Image (AMI): Amazon Linux 2023 AMI, Instance type: t2.micro, Uses the vockey key pair, and Auto-assign Public IP: This setting should be enabled. The right window shows the AWS Management Console 'Instances' page. It lists two instances: 'Bastion Host' (i-0ddf297ae52a3bfe4) and 'CafeWebAppS...' (i-0790052488fb244d). The 'Bastion Host' instance is in a 'Running' state. The console also shows the 'Instance: i-0ddf297ae52a3bfe4 (Bastion Host)' details, including its public IP address (54.242.98.126) and DNS information.

Task 4: Creating a launch template

The screenshot displays two browser windows. The left window shows the 'Module 9 Challenge Lab - Creating a Scalable and Highly Available Environment for the Cafe' on the AWS Academy platform. It highlights 'Task 4: Creating a launch template'. The task instructions state: 'During the lab setup, an Amazon Machine Image (AMI) was created from the CafeWebAppServer instance. In this task, you will create a launch template by using this AMI.' The criteria for the launch template are: AMI: Cafe webServer: Image, Instance type: t2.micro, Key pair (login): Uses a new key pair, Security groups: CafeSG, and Resource tags: Key: Name, Value: webserver. The right window shows the AWS Management Console 'Launch templates' page. It lists one launch template: 'mytemplate' (lt-0232204bb35282b0d). The console also shows the 'Launch template details' for 'mytemplate', including its ID (lt-0232204bb35282b0d), name (mytemplate), and owner (arn:aws:sts::128556005776:assumed-role/voclabs/user2566785-104181789@student.swin.edu.au).

Task 5: Creating an Auto Scaling group

The screenshot shows the AWS Management Console 'Create Auto Scaling group' wizard. The browser address bar shows the URL: `us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup`. The console header shows the user is logged in as `voclaby/user2566785-104181789@student.swin.edu.au` in the `N. Virginia` region. The left sidebar shows the progress of the wizard: 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), and Step 7 (Review). The main content area is titled 'Step 1: Choose launch template' and contains two sections: 'Group details' and 'Step 2: Choose instance launch options'. The 'Group details' section shows the 'Auto Scaling group name' as `autoscaling` and the 'Launch template' as `mytemplate` (ID: `lt-0232204b635282b0d`). The 'Step 2: Choose instance launch options' section shows the 'Network' as `vpc-02c3e7c10e0150062` and a table of 'Availability Zone' and 'Subnet' options. The table has two rows: one for `us-east-1b` with subnet `subnet-053b48f09a8f6e2c9` (CIDR: `10.0.3.0/24`), and one for `us-east-1a` with subnet `subnet-043deff529e3b93cd` (CIDR: `10.0.2.0/24`). The bottom of the console shows a Windows taskbar with a search bar, task icons, and system tray information (5:49 PM, 6/29/2023).

Step 1: Choose launch template

Group details

Auto Scaling group name
autoscaling

Launch template

Launch template	Version	Description
mytemplate	Default	

lt-0232204b635282b0d

Step 2: Choose instance launch options

Network

Network

VPC
vpc-02c3e7c10e0150062

Availability Zone	Subnet	
us-east-1b	subnet-053b48f09a8f6e2c9	10.0.3.0/24
us-east-1a	subnet-043deff529e3b93cd	10.0.2.0/24

Instance type requirements

The screenshot shows the AWS Management Console 'Create Auto Scaling group' wizard, Step 4: Configure group size and scaling policies. The browser address bar shows the URL: `us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup`. The console header shows the user is logged in as `voclaby/user2566785-104181789@student.swin.edu.au` in the `N. Virginia` region. The left sidebar shows the progress of the wizard: 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), and Step 7 (Review). The main content area is titled 'Step 4: Configure group size and scaling policies' and contains three sections: 'Group size', 'Scaling policy', and 'Instance scale-in protection'. The 'Group size' section shows 'Desired capacity' as `2`, 'Minimum capacity' as `2`, and 'Maximum capacity' as `6`. The 'Scaling policy' section shows 'Target tracking scaling' as the 'Policy type', 'Target Tracking Policy' as the 'Scaling policy name', and 'As required to maintain Average CPU utilization at 25' as the 'Execute policy when'. The 'Instance scale-in protection' section shows 'Instance scale-in protection' as `Enabled`. The bottom of the console shows a Windows taskbar with a search bar, task icons, and system tray information (5:50 PM, 6/29/2023).

Step 4: Configure group size and scaling policies

Group size

Desired capacity	Minimum capacity	Maximum capacity
2	2	6

Scaling policy

Target tracking scaling	Scaling policy name	Execute policy when
Policy type Target tracking scaling	Target Tracking Policy	As required to maintain Average CPU utilization at 25
Take the action Add or remove capacity units as required	Instances need 60 seconds to warm up before including in metric	Scale in Enabled

Instance scale-in protection

Instance scale-in protection

Enable instance protection from scale in

Task 6: Creating a load balancer

The image shows a side-by-side comparison of a learning resource and its practical application in the AWS console.

Left Panel (AWS Academy Challenge Lab):

- Module 9 Challenge Lab - Creating a Scalable and Highly Available Environment for the Cafe**
- Task 6: Creating a load balancer**
- Instructions:** Now that you web application server instances are deployed in private subnets, you need a way for the outside world to connect to them. In this task, you will create a load balancer to distribute traffic across your private instances.
- 14. Create an HTTP Application Load Balancer that meets the following criteria:**
 - **VPC:** Uses the VPC configured for this lab
 - **Subnets:** Uses the two *public* subnets
 - Skips the HTTPS security configuration settings
 - **Security group:** Creates a new security group that *allows HTTP traffic from anywhere*
 - **Target group:** Creates a new target group
 - Skips registering targets
- Note:** Wait until the load balancer is active.
- 15. Modify the Auto Scaling group that you created in the previous task by adding this new load balancer.**
- Hint:** Add the *target group* you created in the Load Balancer configuration.

Right Panel (AWS Console):

- Load balancers (1/1)**
- Create load balancer** button is visible.
- Load balancer: loadbalancer** details are shown, including:
 - Load balancer type:** Application
 - Status:** Provisioning
 - Scheme:** Internet-facing
 - Hosted zone:** Z355XDOTRQ7K7K