

Wk3: ACF Lab 2: Build a VPC and launch a Web Server

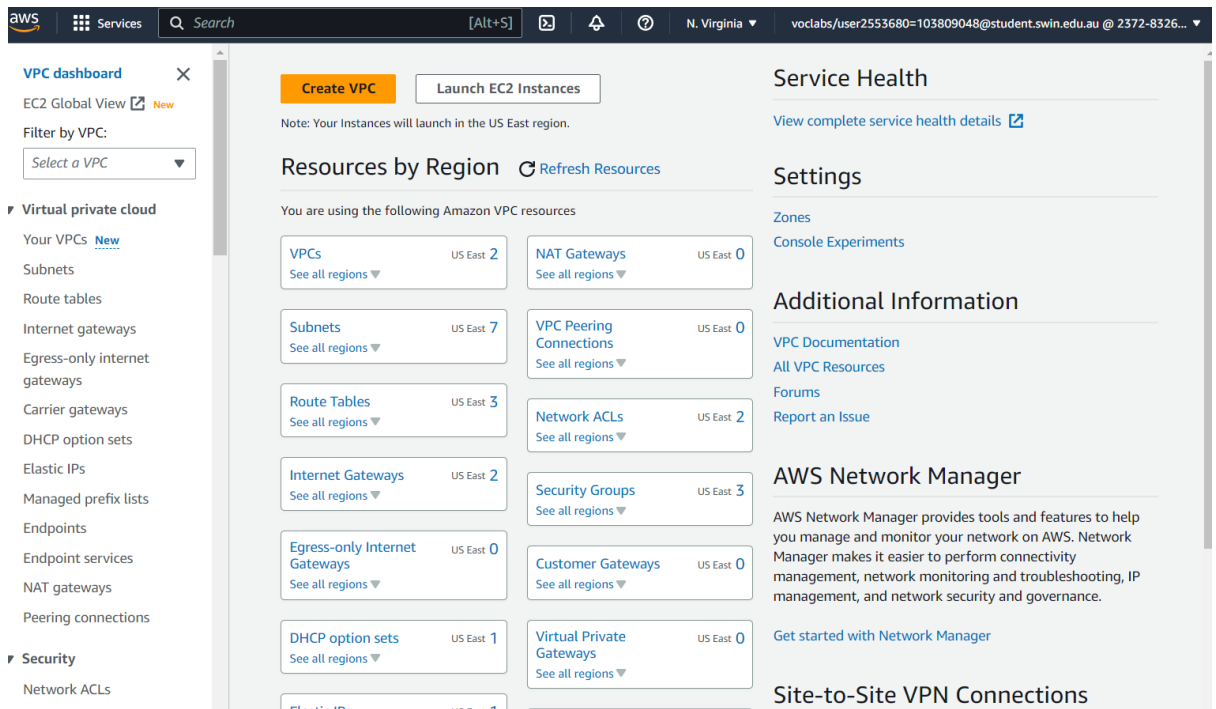
COS20019: Cloud Computing Architecture

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Task 1: Create Your VPC

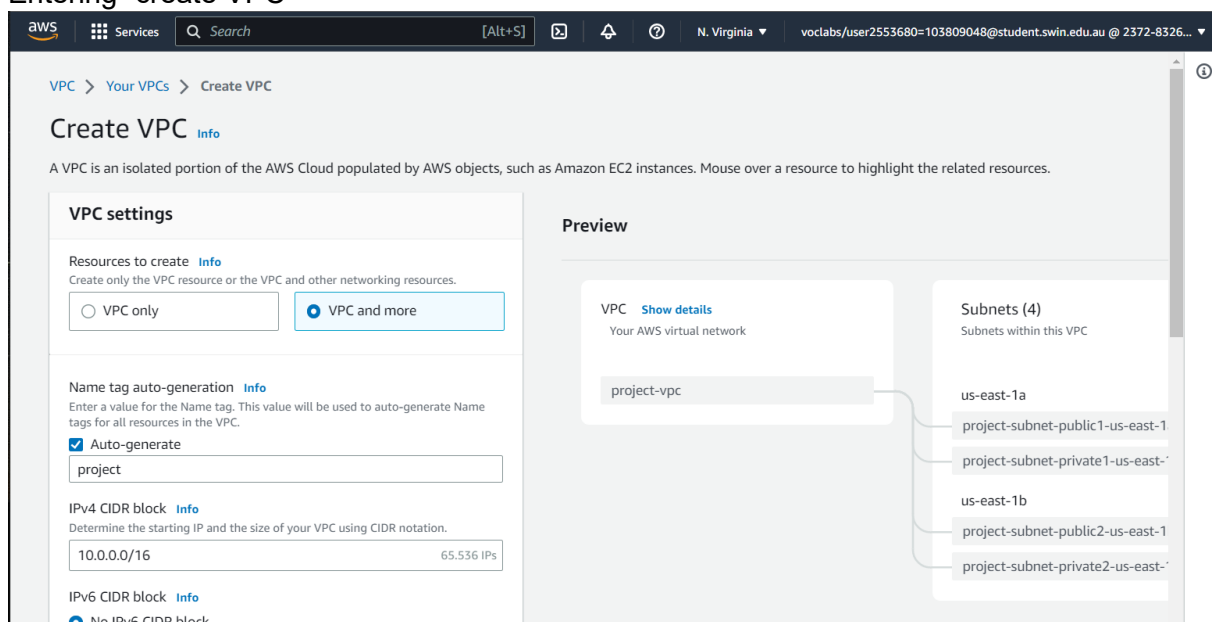
1. Go to VPC service



The screenshot shows the AWS VPC dashboard for the N. Virginia region. The left sidebar contains navigation links for VPC dashboard, EC2 Global View, and various VPC and security resources. The main content area displays 'Resources by Region' for US East 2, listing various VPC resources and their counts. The right sidebar shows 'Service Health', 'Settings', 'Additional Information', 'AWS Network Manager', and 'Site-to-Site VPN Connections'.

Resource	Count
VPCs	2
NAT Gateways	0
Subnets	7
VPC Peering Connections	0
Route Tables	3
Network ACLs	2
Internet Gateways	2
Security Groups	3
Egress-only Internet Gateways	0
Customer Gateways	0
DHCP option sets	1
Virtual Private Gateways	0

2. Entering "create VPC"



The screenshot shows the 'Create VPC' wizard in the AWS console. The 'VPC settings' section is active, showing options for 'Resources to create' (VPC and more), 'Name tag auto-generation' (Auto-generate), and 'IPv4 CIDR block' (10.0.0.0/16). The 'Preview' section shows a diagram of the VPC structure, including the VPC, subnets, and their connections.

VPC settings

Resources to create Info
Create only the VPC resource or the VPC and other networking resources.
☐ VPC only ☒ VPC and more

Name tag auto-generation Info
Enter a value for the Name tag. This value will be used to auto-generate Name tags for all resources in the VPC.
☒ Auto-generate
project

IPv4 CIDR block Info
Determine the starting IP and the size of your VPC using CIDR notation.
10.0.0.0/16 65,536 IPs

IPv6 CIDR block Info
☒ No IPv6 CIDR block

Preview

VPC Show details
Your AWS virtual network

Subnets (4)
Subnets within this VPC

- us-east-1a
 - project-subnet-public1-us-east-1
 - project-subnet-private1-us-east-1
- us-east-1b
 - project-subnet-public2-us-east-1
 - project-subnet-private2-us-east-1

3. Some settings for the current lab

aws

Services

Search

[Alt+S]

N. Virginia

voclabs/user2553680=103809048@student.swin.edu.au @ 2372-8326...

Resources to create [Info](#)

Create only the VPC resource or the VPC and other networking resources.

☐ VPC only

☒ VPC and more

Name tag auto-generation [Info](#)

Enter a value for the Name tag. This value will be used to auto-generate Name tags for all resources in the VPC.

☒ Auto-generate

IPv4 CIDR block [Info](#)

Determine the starting IP and the size of your VPC using CIDR notation.

65,536 IPs

IPv6 CIDR block [Info](#)

☒ No IPv6 CIDR block

☐ Amazon-provided IPv6 CIDR block

Tenancy [Info](#)

▼

Number of Availability Zones (AZs) [Info](#)

Choose the number of AZs in which to provision subnets. We recommend at least two AZs for high availability.

1

2

3

► Customize AZs

Preview

VPC [Show details](#)

Your AWS virtual network

lab-vpc

Subnets (2)

Subnets within this VPC

us-east-1a

lab-subnet-public1-us-east-1a

lab-subnet-private1-us-east-1a

aws

Services

Search

[Alt+S]

N. Virginia

voclabs/user2553680=103809048@student.swin.edu.au @ 2372-8326...

1

2

3

Customize AZs

Number of public subnets

Info

The number of public subnets to add to your VPC. Use public subnets for web applications that need to be publicly accessible over the internet.

0

1

Number of private subnets

Info

The number of private subnets to add to your VPC. Use private subnets to secure backend resources that don't need public access.

0

1

2

Customize subnets CIDR blocks

Public subnet CIDR block in us-east-1a

10.0.0.0/24

256 IPs

Private subnet CIDR block in us-east-1a

10.0.1.0/24

256 IPs

NAT gateways (\$)

Info

Choose the number of Availability Zones (AZs) in which to create NAT gateways. Note that there is a charge for each NAT gateway.

None

In 1 AZ

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.

Preview

VPC

Show details

Your AWS virtual network

lab-vpc

Subnets (2)

Subnets within this VPC

us-east-1a

lab-subnet-public1-us-east-1a

lab-subnet-private1-us-east-1a

aws

Services

Search

[Alt+S]

N. Virginia

voclabs/user2553680=103809048@student.swin.edu.au @ 2372-8326...

Customize subnets CIDR blocks

Public subnet CIDR block in us-east-1a

10.0.0.0/24

256 IPs

Private subnet CIDR block in us-east-1a

10.0.1.0/24

256 IPs

NAT gateways (\$)

Info

Choose the number of Availability Zones (AZs) in which to create NAT gateways. Note that there is a charge for each NAT gateway.

None

In 1 AZ

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
 ☒ Enable DNS resolution

Additional tags

Cancel

Create VPC

Preview

VPC

Show details

Your AWS virtual network

lab-vpc

Subnets (2)

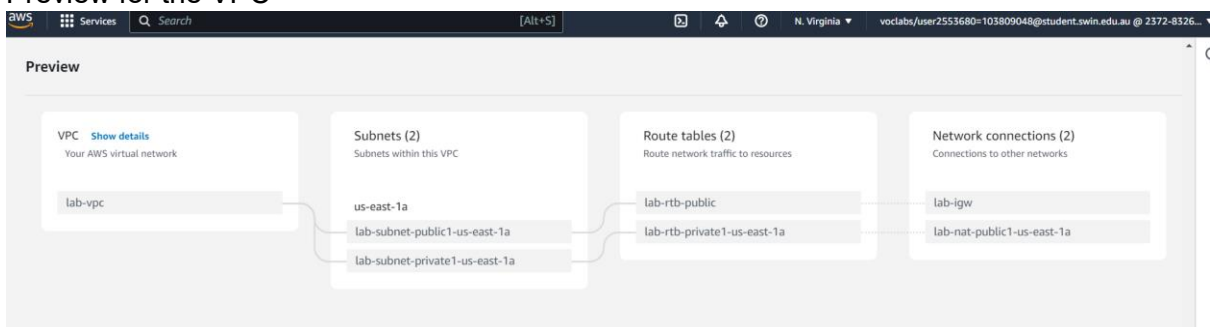
Subnets within this VPC

us-east-1a

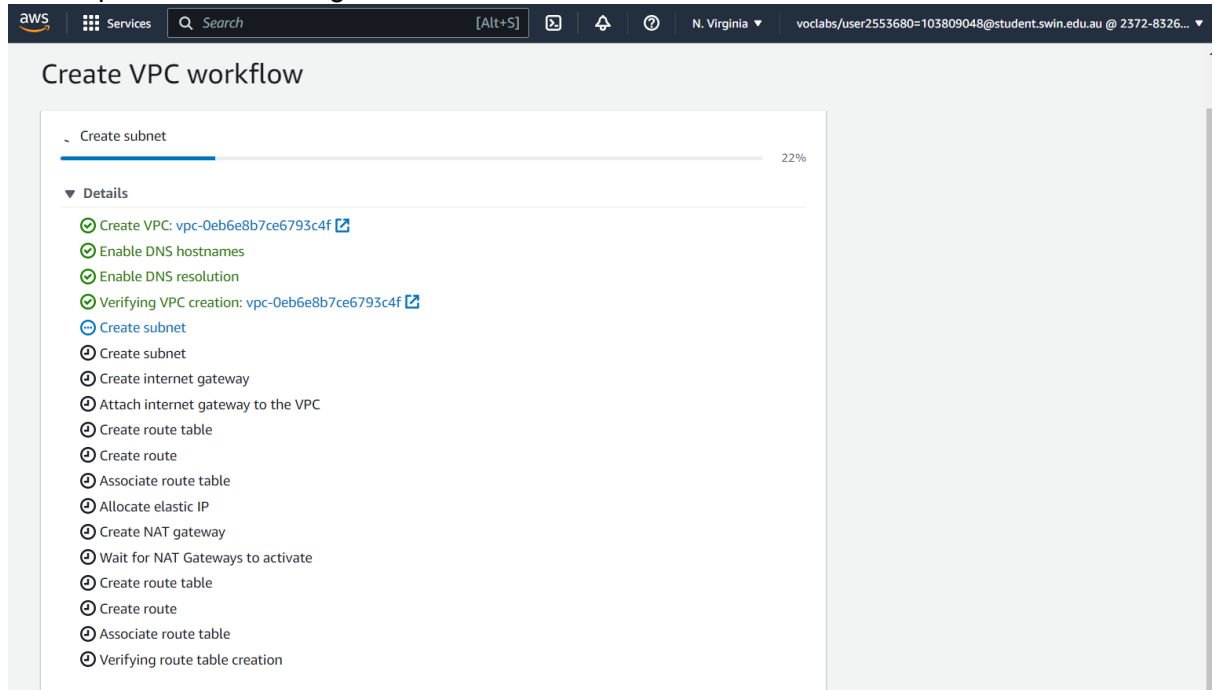
lab-subnet-public1-us-east-1a

lab-subnet-private1-us-east-1a

4. Preview for the VPC

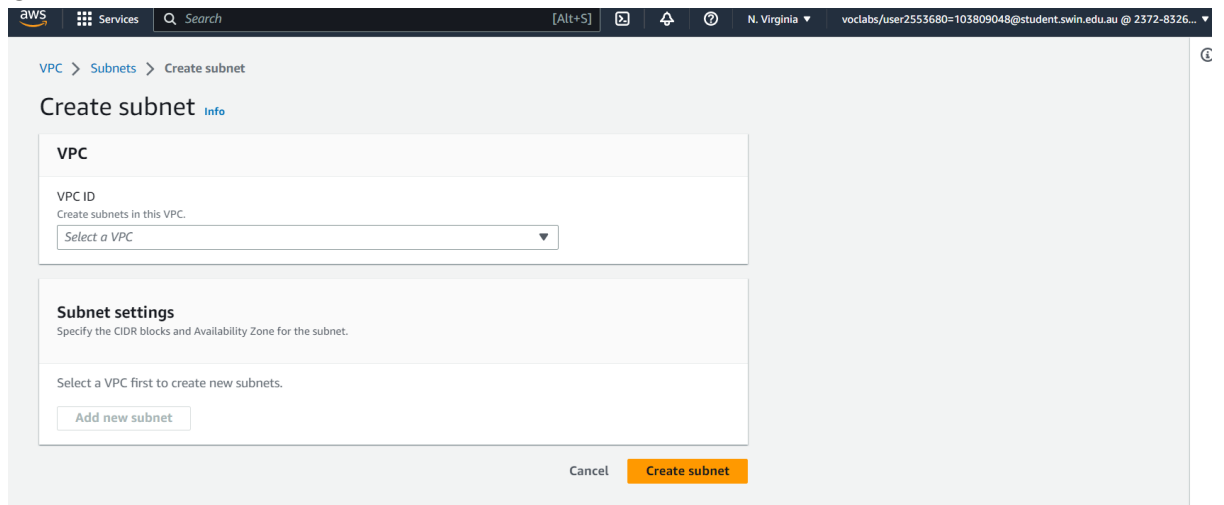


5. All the process of creating VPC



Task 2: Create Additional Subnets

1. Create second subnets



2. Setting for creating subnet

Subnet settings
Specify the CIDR blocks and Availability Zone for the subnet.

Subnet 1 of 1

Subnet name
Create a tag with a key of 'Name' and a value that you specify.
lab-subnet-public2
The name can be up to 256 characters long.

Availability Zone [Info](#)
Choose the zone in which your subnet will reside, or let Amazon choose one for you.
US East (N. Virginia) / us-east-1b

IPv4 CIDR block [Info](#)
10.0.2.0/24

Tags - optional

Key	Value - optional
Name	lab-subnet-public2

[Add new tag](#)
You can add 49 more tags.

[Remove](#)

[Add new subnet](#)

3. Follow the instructions to select the item in the route table

Route tables (1/6) [Info](#)

[Find resources by attribute or tag](#)

	Name	Route table ID	Explicit subnet associati...	Edge associations	Main	VI
<input type="checkbox"/>	-	rtb-014f021f9ceeb8a5	-	-	Yes	vf
<input checked="" type="checkbox"/>	lab-rtb-private1-us-east-1a	rtb-0dcf1bcac0b359529	subnet-051da7480f6ed3...	-	No	vf
<input type="checkbox"/>	-	rtb-0e8be5fccfd7b3c55	-	-	Yes	vf
<input type="checkbox"/>	Work Public Route Table	rtb-03bf89dd4f0e13993	subnet-009c887e6fc2c72...	-	No	vf
<input type="checkbox"/>	lab-rtb-public	rtb-0b64dc5dae096a299	subnet-0f9834dee1e57fc...	-	No	vf
<input type="checkbox"/>	-	rtb-07982ade3fd3a9671	-	-	Yes	vf

rtb-0dcf1bcac0b359529 / lab-rtb-private1-us-east-1a

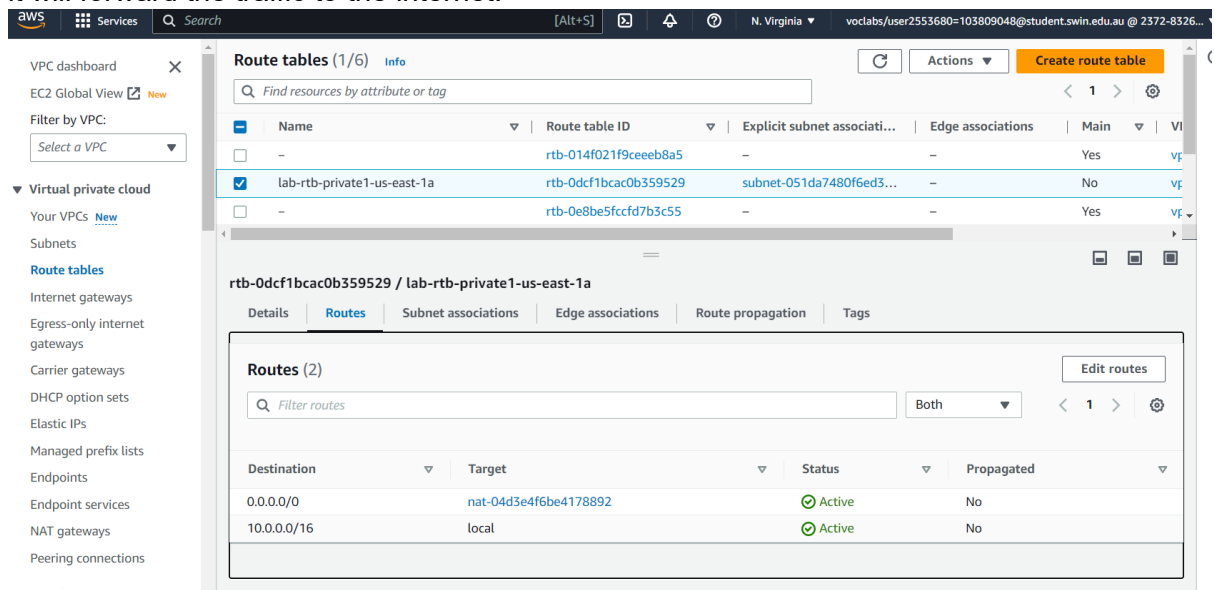
[Details](#) [Routes](#) [Subnet associations](#) [Edge associations](#) [Route propagation](#) [Tags](#)

[You can now check network connectivity with Reachability Analyzer](#) [Run Reachability Analyzer](#)

Details

Route table ID	Main	Explicit subnet associations	Edge associations
rtb-0dcf1bcac0b359529	No	subnet-051da7480f6ed317h / lab-	-

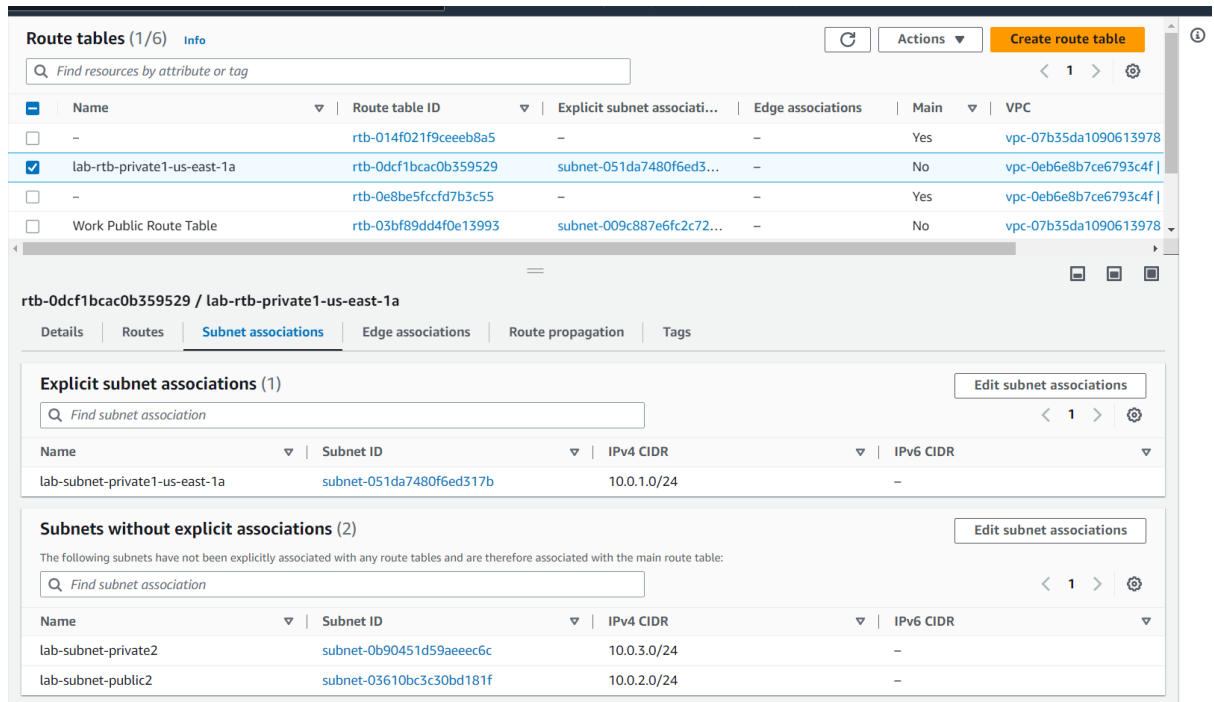
4. The traffic destined for the internet (0.0.0/0) will be sent to the NAT gateway then it will forward the traffic to the internet.



The screenshot shows the AWS Management Console interface for the 'Route tables' section. The left sidebar lists various VPC services, with 'Route tables' selected. The main panel displays a list of route tables for the VPC 'vpc-07b35da1090613978'. The table 'lab-rtb-private1-us-east-1a' (ID: rtb-0dcf1bcac0b359529) is selected. Below the list, the 'Routes' tab is active, showing two routes:

Destination	Target	Status	Propagated
0.0.0/0	nat-04d3e4f6be4178892	Active	No
10.0.0.0/16	local	Active	No

5. Because I have subnet private 1 so after creating another private subnet, this one will associate with this route table .



The screenshot shows the 'Subnet associations' tab for the selected route table 'lab-rtb-private1-us-east-1a'. It displays the explicit subnet associations and a list of subnets without explicit associations.

Explicit subnet associations (1)

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
lab-subnet-private1-us-east-1a	subnet-051da7480f6ed317b	10.0.1.0/24	-

Subnets without explicit associations (2)

The following subnets have not been explicitly associated with any route tables and are therefore associated with the main route table:

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
lab-subnet-private2	subnet-0b90451d59aeec6c	10.0.3.0/24	-
lab-subnet-public2	subnet-03610bc3c30bd181f	10.0.2.0/24	-

6. Following the instructions

VPC > Route tables > rtb-0dcf1bcac0b359529 > Edit subnet associations

Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (2/4)

Filter subnet associations

	Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
<input checked="" type="checkbox"/>	lab-subnet-private2	subnet-0b90451d59aeeec6c	10.0.3.0/24	–	Main (rtb-0e8be5fccfd7b3c55)
<input type="checkbox"/>	lab-subnet-public2	subnet-03610bc3c30bd181f	10.0.2.0/24	–	Main (rtb-0e8be5fccfd7b3c55)
<input checked="" type="checkbox"/>	lab-subnet-private1-us-east-1a	subnet-051da7480f6ed317b	10.0.1.0/24	–	rtb-0dcf1bcac0b359529 / lab-rtb-priv...
<input type="checkbox"/>	lab-subnet-public1-us-east-1a	subnet-0f9834dee1e57fc68	10.0.0.0/24	–	rtb-0b64dc5dae096a299 / lab-rtb-public

Selected subnets

subnet-051da7480f6ed317b / lab-subnet-private1-us-east-1a X subnet-0b90451d59aeeec6c / lab-subnet-private2 X

Cancel Save associations

7. Following the instructions for edit the lab-rtb-public

VPC > Route tables > rtb-0b64dc5dae096a299 > Edit subnet associations

Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (2/4)

Filter subnet associations

	Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
<input type="checkbox"/>	lab-subnet-private2	subnet-0b90451d59aeeec6c	10.0.3.0/24	–	rtb-0dcf1bcac0b359529 / lab-rtb-priv...
<input checked="" type="checkbox"/>	lab-subnet-public2	subnet-03610bc3c30bd181f	10.0.2.0/24	–	Main (rtb-0e8be5fccfd7b3c55)
<input type="checkbox"/>	lab-subnet-private1-us-east-1a	subnet-051da7480f6ed317b	10.0.1.0/24	–	rtb-0dcf1bcac0b359529 / lab-rtb-priv...
<input checked="" type="checkbox"/>	lab-subnet-public1-us-east-1a	subnet-0f9834dee1e57fc68	10.0.0.0/24	–	rtb-0b64dc5dae096a299 / lab-rtb-public

Selected subnets

subnet-0f9834dee1e57fc68 / lab-subnet-public1-us-east-1a X subnet-03610bc3c30bd181f / lab-subnet-public2 X

Cancel Save associations

Task 3: Create a VPC security group

1. Configure security group

A security group acts as a virtual firewall for your instance to control inbound and outbound traffic. To create a new security group, complete the fields below.

Basic details

Security group name [Info](#)
Web Security Group
Name cannot be edited after creation.

Description [Info](#)
Enable HTTP access

VPC [Info](#)
vpc-0eb6e8b7ce6793c4f

Inbound rules [Info](#)

Inbound rule 1 Delete

Type Info	Protocol Info	Port range Info
HTTP	TCP	80
Source type Info	Source Info	Description - optional Info
Anywhere-IPv4	0.0.0.0/0	Permit web requests

2. Configure EC2 – key pair : this help to connect the instance via SSH after it has launched.

Instance type [Info](#)

Instance type

t2.micro Free tier eligible

Family: t2 1 vCPU 1 GiB Memory Current generation: true

On-Demand Windows pricing: 0.0162 USD per Hour

On-Demand SUSE pricing: 0.0116 USD per Hour

On-Demand RHEL pricing: 0.0716 USD per Hour

On-Demand Linux pricing: 0.0116 USD per Hour

☒ All generations [Compare instance types](#)

Key pair (login) [Info](#)

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - required

vockey Create new key pair

3. Configure EC2 – network settings

VPC - required [Info](#)

vpc-0eb6e8b7ce6793c4f (lab-vpc)
10.0.0.0/16

Subnet [Info](#)

subnet-03610bc3c30bd181f lab-subnet-public2
VPC: vpc-0eb6e8b7ce6793c4f Owner: 237283263239 Availability Zone: us-east-1b
IP addresses available: 251 CIDR: 10.0.2.0/24

Auto-assign public IP [Info](#)

Enable

Firewall (security groups) [Info](#)

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

☐ Create security group ☒ Select existing security group

Common security groups [Info](#)

Select security groups

Web Security Group sg-0c39e74a8ed35799b X
VPC: vpc-0eb6e8b7ce6793c4f

Security groups that you add or remove here will be added to or removed from all your network interfaces.

► Advanced network configuration

4. Configure EC2 – advanced details – this script will root the user permissions on the guest OS of the instance. The script installs a web server, a database and PHP libraries then it downloads and install PHP web application on the web server.

Metadata response hop limit [Info](#)

Select

Allow tags in metadata [Info](#)

Select

User data - optional [Info](#)

Enter user data in the field.

```
#!/bin/bash
# Install Apache Web Server and PHP
dnf install -y httpd wget php mariadb105-server
# Download Lab files
wget https://aws-tc-largeobjects.s3.us-west-2.amazonaws.com/CUR-TF-100-ACCLFO-2/2-lab2-vpc/s3/lab-app.zip
unzip lab-app.zip -d /var/www/html/
# Turn on web server
chkconfig httpd on
service httpd start
```

☐ User data has already been base64 encoded

5. Get the IP and paste it into the browser

The screenshot shows the AWS Management Console interface. On the left, there's a navigation menu with options like EC2 Dashboard, EC2 Global View, Events, Limits, and a list of services under 'Instances' and 'Images'. The main panel displays a table of EC2 instances. Two instances are listed: 'Bastion Host' and 'Web server 1'. The 'Web server 1' instance is selected, and its details are shown in a panel below. The details panel includes tabs for Details, Security, Networking, Storage, Status checks, Monitoring, and Tags. Under the 'Details' tab, the 'Instance summary' section shows the instance ID 'i-08cb2d70e9a6b021a' (Web server 1), its state as 'Running', and its public IPv4 address as '34.228.184.128'. A link 'open address' is provided next to the IP address.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
Bastion Host	i-0bc3ac052baee4651	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a
Web server 1	i-08cb2d70e9a6b021a	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b

Instance: i-08cb2d70e9a6b021a (Web server 1)

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

Instance summary info

Instance ID	i-08cb2d70e9a6b021a (Web server 1)	Public IPv4 address	34.228.184.128 open address	Private IPv4 addresses	10.0.2.211
IPv6 address	-	Instance state	Running	Public IPv4 DNS	ec2-34-228-184-128.compute-1.amazonaws.com open address
Hostname type	IP name: in-10.0.2.211 or ? internal	Private IP DNS name (IPv4 only)	in-10.0.2.211 or ? internal		

6. The result :

The screenshot shows a web browser window with the URL 'ec2-34-228-184-128.compute-1.amazonaws.com'. The page displays the AWS console interface for the 'Web server 1' instance. The page shows the public IPv4 address '34.228.184.128' and the current CPU load of 1%.

Meta-Data	Value
InstanceId	i-08cb2d70e9a6b021a
Availability Zone	us-east-1b

Current CPU Load: 1%