

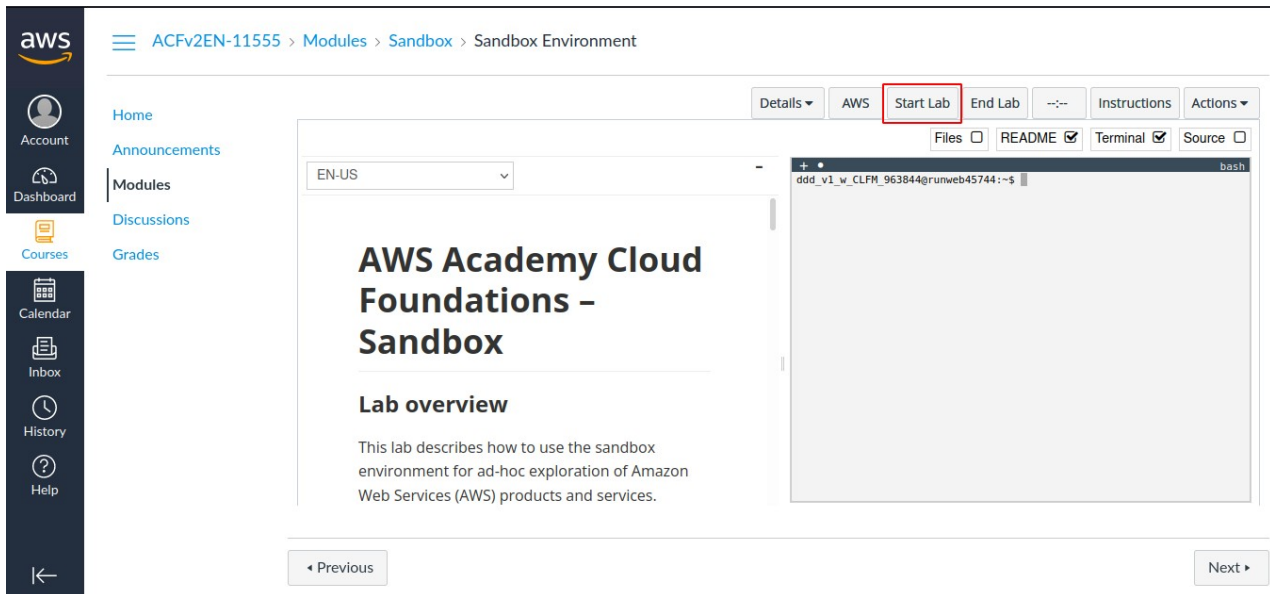
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Cloud Computing

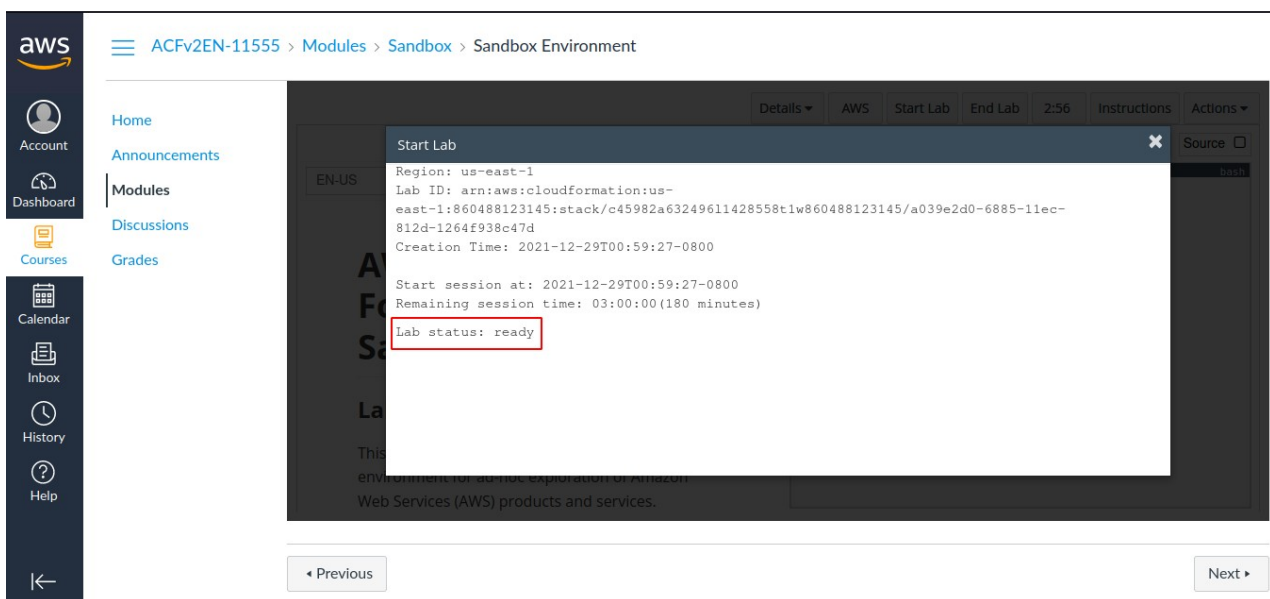
Practical Assignment No. 9

Build your VPC and Launch a Web Server

Step 1: At the top right panel above the console, choose **Start Lab** to launch your lab.

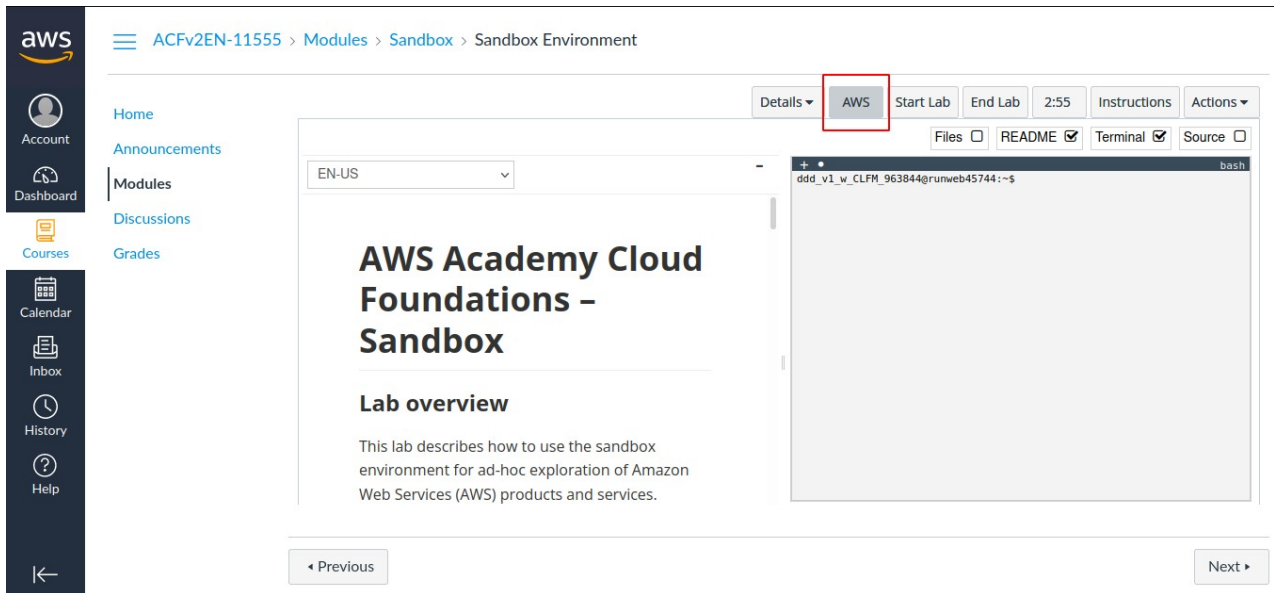


Step 2: Wait until you see the message "**Lab status: ready**", then choose the **X** to close the Start Lab panel.

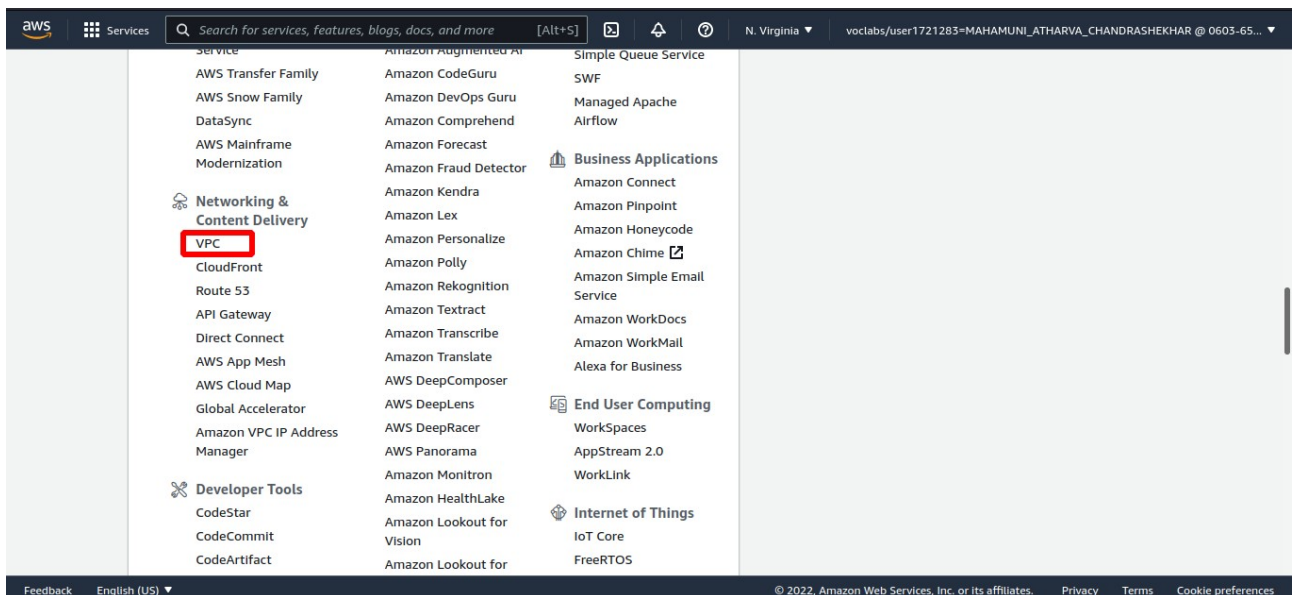


Step 3: Now choose AWS

This will open the AWS Management Console in a new browser tab. The system will automatically log you in.



Step 4: In the AWS Management Console on the Services menu, choose VPC.



Step 5: Choose Launch VPC Wizard

The screenshot shows the AWS VPC Dashboard. In the left-hand navigation pane, the 'Launch VPC Wizard' button is highlighted with a red rectangular box. The main content area displays a notification about using Amazon VPC IP Address Manager, a 'Service Health' section indicating that Amazon EC2 - US East is operating normally, and a 'Resources by Region' section showing counts for various VPC resources in the US East region. The 'Launch EC2 Instances' button is also visible next to the highlighted wizard button.

Step 6: In the left navigation pane, choose **VPC with Public and Private Subnets** (the second option).

The screenshot shows the 'Step 1: Select a VPC Configuration' wizard. On the left, a list of configuration options is shown, with 'VPC with Public and Private Subnets' selected and highlighted. The main area provides details for this configuration, including a description of the public and private subnets and a diagram illustrating the network architecture. The diagram shows an 'Amazon Virtual Private Cloud' containing a 'Public Subnet' and a 'Private Subnet', connected by a 'NAT' gateway. The 'Public Subnet' is connected to 'Internet S3, DynamoDB, SNS, SQS, etc.'. An 'Important' note states: 'If you are using a Local Zone with your VPC follow this link to create your VPC.' A blue 'Select' button is at the bottom right of the configuration details. A 'Cancel and Exit' link is located at the bottom right of the wizard.

Step 7: Choose Select then configure, Once it is complete, choose **Create VPC**

The screenshot shows the AWS VPC console configuration page. At the top, there's a header with the AWS logo, 'Services' link, a search bar, and user information. The main configuration area includes fields for 'Public subnet's IPv4 CIDR' (10.0.0.0/24), 'Availability Zone' (us-east-1a), 'Public subnet name' (Public Subnet 1), 'Private subnet's IPv4 CIDR' (10.0.1.0/24), and 'Private subnet name' (Private Subnet 1). Below these, there's a section for 'Specify the details of your NAT gateway' with an 'Elastic IP Allocation ID' (eipalloc-0e66fc9f56959e910). There's also a 'Service endpoints' section with an 'Add Endpoint' button. At the bottom, there's a section for 'Enable DNS hostnames' (Yes) and 'Hardware tenancy' (Default). On the right side, there are three buttons: 'Cancel and Exit', 'Back', and 'Create VPC'.

Public subnet's IPv4 CIDR: 10.0.0.0/24 (251 IP addresses available)

Availability Zone: us-east-1a

Public subnet name: Public Subnet 1

Private subnet's IPv4 CIDR: 10.0.1.0/24 (251 IP addresses available)

Availability Zone: us-east-1a

Private subnet name: Private Subnet 1

You can add more subnets after Amazon Web Services creates the VPC.

Specify the details of your NAT gateway (NAT gateway rates apply).

Elastic IP Allocation ID: eipalloc-0e66fc9f56959e910

Service endpoints

Add Endpoint

Enable DNS hostnames: Yes No

Hardware tenancy: Default

Cancel and Exit Back Create VPC

Step 8: Create Additional Subnets

In the left navigation pane, choose **Subnets**.

First, you will create a second Public Subnet. Choose **Create subnet** then configure:

The screenshot shows the AWS VPC console 'Subnets' page. On the left, there's a navigation pane with 'Subnets' selected. The main area shows a table of subnets. At the top right, there's a 'Create subnet' button highlighted with a red box. Below the table, there's a 'Select a subnet' section.

Subnets (9) Info

Filter subnets

	Name	Subnet ID	State	VPC	IPv4 CIDR
<input type="checkbox"/>	Private Subnet 1	subnet-031116fd61fed3170	Available	vpc-0b0b57762415b507f La...	10.0.1.0/24
<input type="checkbox"/>	-	subnet-08b9476443208e7b9	Available	vpc-023a67e768e1b8b2f	172.31.64.0/20
<input type="checkbox"/>	-	subnet-06c6a06368019f0be	Available	vpc-023a67e768e1b8b2f	172.31.32.0/20
<input type="checkbox"/>	-	subnet-06f31b91b6ee8aa0b	Available	vpc-023a67e768e1b8b2f	172.31.16.0/20
<input type="checkbox"/>	Public Subnet 1	subnet-07d8a196c512a2539	Available	vpc-0b0b57762415b507f La...	10.0.0.0/24

Select a subnet

Step 9: Choose Create subnet

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: Name Value: Public Subnet 2 Remove

Add new tag
You can add 49 more tags.

Remove

Add new subnet

Cancel Create subnet

Do the same for private subnet 2

Step 10: In the left navigation pane, choose **Route Tables**.

New VPC Experience [Learn more](#)

VPC Dashboard
EC2 Global View [New](#)

Filter by VPC:
Select a VPC

VIRTUAL PRIVATE CLOUD
Your VPCs
Subnets
Route Tables
Internet Gateways
Egress Only Internet Gateways
Carrier Gateways
DHCP Options Sets
Elastic IPs
Managed Prefix Lists
Endpoints
Endpoint Services

You have successfully created 1 subnet: subnet-08bfc393272d7d1d6

Subnets (11) [Info](#) Actions Create subnet

Filter subnets

	Name	Subnet ID	State	VPC	IPv4 CIDR
<input type="checkbox"/>	Private Subnet 1	subnet-031116fd61fed3170	Available	vpc-0b0b57762415b507f La...	10.0.1.0/24
<input type="checkbox"/>	-	subnet-08b9476443208e7b9	Available	vpc-023a67e768e1b8b2f	172.31.64.0/20
<input type="checkbox"/>	-	subnet-06c6a06368019f0be	Available	vpc-023a67e768e1b8b2f	172.31.32.0/20

Select a subnet

Step 11: Select the route table with **Main = Yes** and **VPC = Lab VPC**

The screenshot shows the AWS Management Console interface for the 'Route tables (5)' page. The table lists the following route tables:

Route table ID	Explicit subnet associat...	Edge associations	Main	VPC	Ow...
rtb-07753087f33000533	-	-	Yes	vpc-023a67e768e1b8b2f	79129
rtb-0f2a9eb433056b5b0	subnet-07d8a196c512a...	-	No	vpc-0b0b57762415b507f Lab VPC	79129
rtb-03d3367fb6d69d62b	subnet-004c17f1abe28...	-	No	vpc-07b063f0034028939 Work VPC	79129
rtb-00620df185e0410ce	-	-	Yes	vpc-07b063f0034028939 Work VPC	79129
rtb-0b8f1f474ac9df826	-	-	Yes	vpc-0b0b57762415b507f Lab VPC	79129

Step 12: In the Name column for this route table, choose the pencil then type **Private Route Table** and choose Save

The screenshot shows the AWS Management Console interface for the 'Route tables (1/5)' page. The route table 'rtb-0b8f1f474ac9df826' is selected. An 'Edit Name' dialog box is open, showing the current name 'rtb-0b8f1f474ac9df826' and the new name 'Private Route Table' entered in the text field. The 'Save' button is highlighted.

Step 13: In the lower pane, choose the **Subnet Associations** tab.
Choose Edit subnet associations

The screenshot shows the AWS Management Console interface. On the left is a navigation pane with options like 'VPC Dashboard', 'EC2 Global View', and 'Route Tables'. The main area displays 'Route tables (1/5)' with a table listing route tables. The selected route table, 'rtb-0b8f1f474ac9df826 / Private Route Table', is shown in detail. The 'Subnet associations' tab is active, showing 'Explicit subnet associations (0)'. A red box highlights the 'Edit subnet associations' button. Below this is a table for subnet associations with columns for Subnet ID, IPv4 CIDR, and IPv6 CIDR. The status 'No subnet associations' is displayed.

Name	Route table ID	Explicit subnet associat...	Edge associations	Main	VPC
-	rtb-07753087f33000533	-	-	Yes	vpc-023a67e76c

Subnet ID	IPv4 CIDR	IPv6 CIDR
No subnet associations		

Step 14: Select both Private Subnet 1 and Private Subnet 2.
Choose Save associations

The screenshot shows the 'Available subnets (2/4)' section of the AWS Management Console. It features a table with columns for Name, Subnet ID, IPv4 CIDR, IPv6 CIDR, and Route table ID. Two subnets are selected: 'Private Subnet 1' and 'Private Subnet 2'. Below the table, the 'Selected subnets' section shows the selected subnets as tags. At the bottom right, there are 'Cancel' and 'Save associations' buttons.

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
<input checked="" type="checkbox"/> Private Subnet 1	subnet-031116fd61fed3170	10.0.1.0/24	-	Main (rtb-0b8f1f474ac9df826 / Private Route Table)
<input type="checkbox"/> Public Subnet 1	subnet-07d8a196c512a2539	10.0.0.0/24	-	rtb-0f2a9eb433056b5b0
<input type="checkbox"/> Public Subnet 2	subnet-038a51d1910f543d5	10.0.2.0/24	-	Main (rtb-0b8f1f474ac9df826 / Private Route Table)
<input checked="" type="checkbox"/> Private Subnet 2	subnet-08bfc393272d7d1d6	10.0.3.0/24	-	Main (rtb-0b8f1f474ac9df826 / Private Route Table)

Selected subnets

subnet-031116fd61fed3170 / Private Subnet 1 subnet-08bfc393272d7d1d6 / Private Subnet 2

Cancel Save associations

Step 15: Select the route table with **Main = No** and **VPC = Lab VPC** (and deselect any other subnets).

In the **Name** column for this route table, choose the pencil then type **Public Route Table**, and choose **Save**

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VPC Dashboard EC2 Global View New

Filter by VPC: Select a VPC

VIRTUAL PRIVATE CLOUD

Your VPCs Subnets

Route Tables

Internet Gateways

Egress Only Internet Gateways

Carrier Gateways

DHCP Options Sets

Elastic IPs

Managed Prefix Lists

Endpoints

Endpoint Services

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You have successfully updated subnet associations for rtb-0b8f1f474ac9df826 / Private Route Table.

Route tables (1/5) Info

Filter route tables

Actions Create route table

	Name	Route table ID	Explicit subnet associat...	Edge associations	Main	VPC
<input type="checkbox"/>	-	rtb-07753087f33000533	-	-	Yes	vpc-023a67e766
<input checked="" type="checkbox"/>	Edit Name	rtb-0f2a9eb433056b5b0	subnet-07d8a196c512a...	-	No	vpc-0b0b57762...
<input type="checkbox"/>	Work	rtb-0b8f1f474ac9df826	subnet-004c17f1abe28...	-	No	vpc-07b063f003

rtb-0f2a9eb433056b5b0

Cancel Save

Details Routes Subnet associations Edge associations Route propagation Tags

Details

Step 16: Choose the **Subnet Associations** tab, Choose **Edit subnet associations**

Select both **Public Subnet 1** and **Public Subnet 2**, Choose **Save associations**

aws Services Search for services, features, blogs, docs, and more [Alt+S] N. Virginia voclabs/user1721283=MAHAMUNI_ATHARVA_CHANDRASHEKHAR @ 7912-95...

Available subnets (2/4)

Filter subnet associations

	Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
<input type="checkbox"/>	Private Subnet 1	subnet-031116fd61fed3170	10.0.1.0/24	-	rtb-0b8f1f474ac9df826 / Private Route Table
<input checked="" type="checkbox"/>	Public Subnet 1	subnet-07d8a196c512a2539	10.0.0.0/24	-	rtb-0f2a9eb433056b5b0 / Public Route Table
<input checked="" type="checkbox"/>	Public Subnet 2	subnet-038a51d1910f543d5	10.0.2.0/24	-	Main (rtb-0b8f1f474ac9df826 / Private Route Table)
<input type="checkbox"/>	Private Subnet 2	subnet-08bfc393272d7d1d6	10.0.3.0/24	-	rtb-0b8f1f474ac9df826 / Private Route Table

Selected subnets

subnet-038a51d1910f543d5 / Public Subnet 2 X subnet-07d8a196c512a2539 / Public Subnet 1 X

Cancel Save associations

https://console.aws.amazon.com/vpc/home?region=us-east-1#subnets:SubnetId=subnet-08bfc393272d7d1d6 © 2022, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Step 17: Create a VPC Security Group

In the left navigation pane, choose **Security Groups**, Choose Create security group and then configure:

Security group name [Info](#)

Web Security Group

Name cannot be edited after creation.

Description [Info](#)

Enable HTTP access

VPC [Info](#)

vpc-0b0b57762415b507f

Inbound rules [Info](#)

Type Info	Protocol Info	Port range Info	Source Info	Description - optional Info	
HTTP	TCP	80	Anywh...	Permit web requests	Delete

Add rule

0.0.0.0/0

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Step 18: Launch a Web Server Instance

On the Services menu, choose **EC2**. Choose **Launch Instance**, and then choose **Launch Instance**

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EC2 Dashboard

EC2 Global View

Events

Tags

Limits

Instances

Instances [New](#)

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances [New](#)

Dedicated Hosts

Scheduled Instances

Capacity Reservations

Instances (1) [Info](#)

Search

Connect Instance state Actions **Launch Instances**

Launch Instances

Launch instance from template

	Name	Instance ID	Instance state	Instance type	Status check			
<input type="checkbox"/>	Bastion Host	i-09899652e25b286fe	Running	t2.micro	2/2 checks passed	No alarms	+	us-east-1a

Select an instance

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Step 19: In the row for **Amazon Linux 2** (at the top), choose Select Select **t2.micro** (shown in the *Type* column).

Choose Next: Configure Instance Details

The screenshot shows the 'Step 3: Configure Instance Details' page in the AWS Management Console. The page title is 'Step 3: Configure Instance Details' with a subtitle 'Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.' The page has a progress bar at the top with steps: 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance (active), 4. Add Storage, 5. Add Tags, 6. Configure Security Group, 7. Review. The main content area includes: 'Number of instances' set to 1 with a 'Launch into Auto Scaling Group' link; 'Purchasing option' with 'Request Spot instances' unchecked; 'Network' dropdown set to 'vpc-0b0b57762415b507f | Lab VPC' with a 'Create new VPC' link; 'Subnet' dropdown set to 'subnet-038a51d1910f543d5 | Public Subnet 2 | us-ei-' with a 'Create new subnet' link; 'Auto-assign Public IP' set to 'Enable'; 'Hostname type' set to 'Use subnet setting (IP name)'; and 'DNS Hostname' with 'Enable IP name IPv4 (A record) DNS requests' checked, 'Enable resource-based IPv4 (A record) DNS requests' checked, and 'Enable resource-based IPv6 (AAAA record) DNS requests' unchecked. At the bottom right are buttons: 'Cancel', 'Previous', 'Review and Launch', and 'Next: Add Storage'.

Step 20: Choose Add Tag then configure:

- **Key:** Name
- **Value:** Web Server 1

The screenshot shows the 'Step 5: Add Tags' page in the AWS Management Console. The page title is 'Step 5: Add Tags' with a subtitle 'A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. A copy of a tag can be applied to volumes, instances or both. Tags will be applied to all instances and volumes. [Learn more](#) about tagging your Amazon EC2 resources.' The page has a progress bar at the top with steps: 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Add Tags (active), 6. Configure Security Group, 7. Review. The main content area includes a table with columns: 'Key' (128 characters maximum), 'Value' (256 characters maximum), 'Instances' (with an info icon), 'Volumes' (with an info icon), and 'Network Interfaces' (with an info icon). A single tag is added with 'Name' as the key and 'Web Server 1' as the value, with checkmarks in the 'Instances', 'Volumes', and 'Network Interfaces' columns. Below the table is a button 'Add another tag' with the text '(Up to 50 tags maximum)'. At the bottom right are buttons: 'Cancel', 'Previous', 'Review and Launch', and 'Next: Configure Security Group'.

Step 21: Choose Next: Configure Security Group, Select **Select an existing security group** Select **Web Security Group**, Choose **Review and Launch**

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☐ Create a new security group
☒ Select an existing security group

Security Group ID	Name	Description	Actions
sg-01b3a23fcefb1ab41	default	default VPC security group	Copy to new
sg-0761f3de97e75b423	Web Security Group	Enable HTTP access	Copy to new

Inbound rules for sg-0761f3de97e75b423 (Selected security groups: sg-0761f3de97e75b423)

Type	Protocol	Port Range	Source	Description
HTTP	TCP	80	0.0.0.0/0	Permit web request...

[Cancel](#) [Previous](#) [Review and Launch](#)

Step 22: Review the instance information and choose Launch In the **Select an existing keypair** dialog, select **I acknowledge....**

Choose Launch Instances

Step 7: Review Instance Launch

Please review your instance launch details. You can edit any of the details before launching your instance.

AMI Details

Amazon Linux 2 AMI (HVM) - K...
Free tier eligible
Amazon Linux 2 comes with five years of security updates and software packages through extras. The latest version is 2.29.1, and the latest...
Root Device Type: ebs Virtualization type: hvm

Instance Type

Instance Type	ECUs	vCPUs
t2.micro	-	1

Security Groups

Security Group ID

Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance. Amazon EC2 supports ED25519 and RSA key pair types.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Choose an existing key pair
Select a key pair
vockey | RSA

☒ I acknowledge that I have access to the corresponding private key file, and that without this file, I won't be able to log into my instance.

[Cancel](#) [Launch Instances](#)

[Cancel](#) [Previous](#) [Launch](#)

Step 23: Wait until **Web Server 1** shows *2/2 checks passed* in the **Status Checks** column. Select **Web Server 1**.

Copy the **Public DNS (IPv4)** value shown in the **Description** tab at the bottom of the page.

The screenshot shows the AWS Management Console interface for an EC2 instance. The instance ID is i-0001cf47124250641 (Web Server 1). The instance state is Running. The Public IPv4 address is 54.145.213.37. The Public IPv4 DNS is ec2-54-145-213-37.compute-1.amazonaws.com. The instance type is t2.micro. The AWS Compute Optimizer finding shows a warning for the user role.

Instance ID	Public IPv4 address	Private IPv4 addresses
i-0001cf47124250641 (Web Server 1)	54.145.213.37 open address	10.0.2.215

Instance state	Public IPv4 DNS
Running	ec2-54-145-213-37.compute-1.amazonaws.com open address

Private IP DNS name (IPv4 only)	Answer private resource DNS name
ip-10-0-2-215.ec2.internal	IPV4 (A)

Elastic IP addresses	VPC ID
-	vpc-0b0b57762415b507f (Lab VPC)

IAM Role	Subnet ID
-	subnet-038a51d1910f543d5 (Public Subnet 2)

Step 24: Open a new web browser tab, paste the **Public DNS** value and press Enter. You should see a web page displaying the AWS logo and instance meta-data values.

The screenshot shows a web browser displaying the AWS logo and instance meta-data values. The meta-data table shows the Instance ID as i-0001cf47124250641 and the Availability Zone as us-east-1b. The current CPU load is 1%.

Meta-Data	Value
InstanceId	i-0001cf47124250641
Availability Zone	us-east-1b

Current CPU Load: 1%

