

# 019 Practical

VPC, Subnet, Internet Gateway,  
Route Table and NAT Gateway

**Now we have to create VPC**

The screenshot shows the AWS VPC Management Console interface. On the left, a sidebar lists various VPC-related services under 'VIRTUAL PRIVATE CLOUD'. The 'Your VPCs' option is selected and highlighted with a red box. In the main content area, a table titled 'Your VPCs (1)' displays one existing VPC entry. The table columns include Name, VPC ID, State, IPv4 CIDR, IPv6 CIDR, and DHCP options. The first VPC entry has a VPC ID of 'vpc-0d530da491583e01c', is in 'Available' state, and has an IPv4 CIDR of '172.31.0.0/16'. A large orange 'Create VPC' button is located at the top right of the table area, also highlighted with a red box.

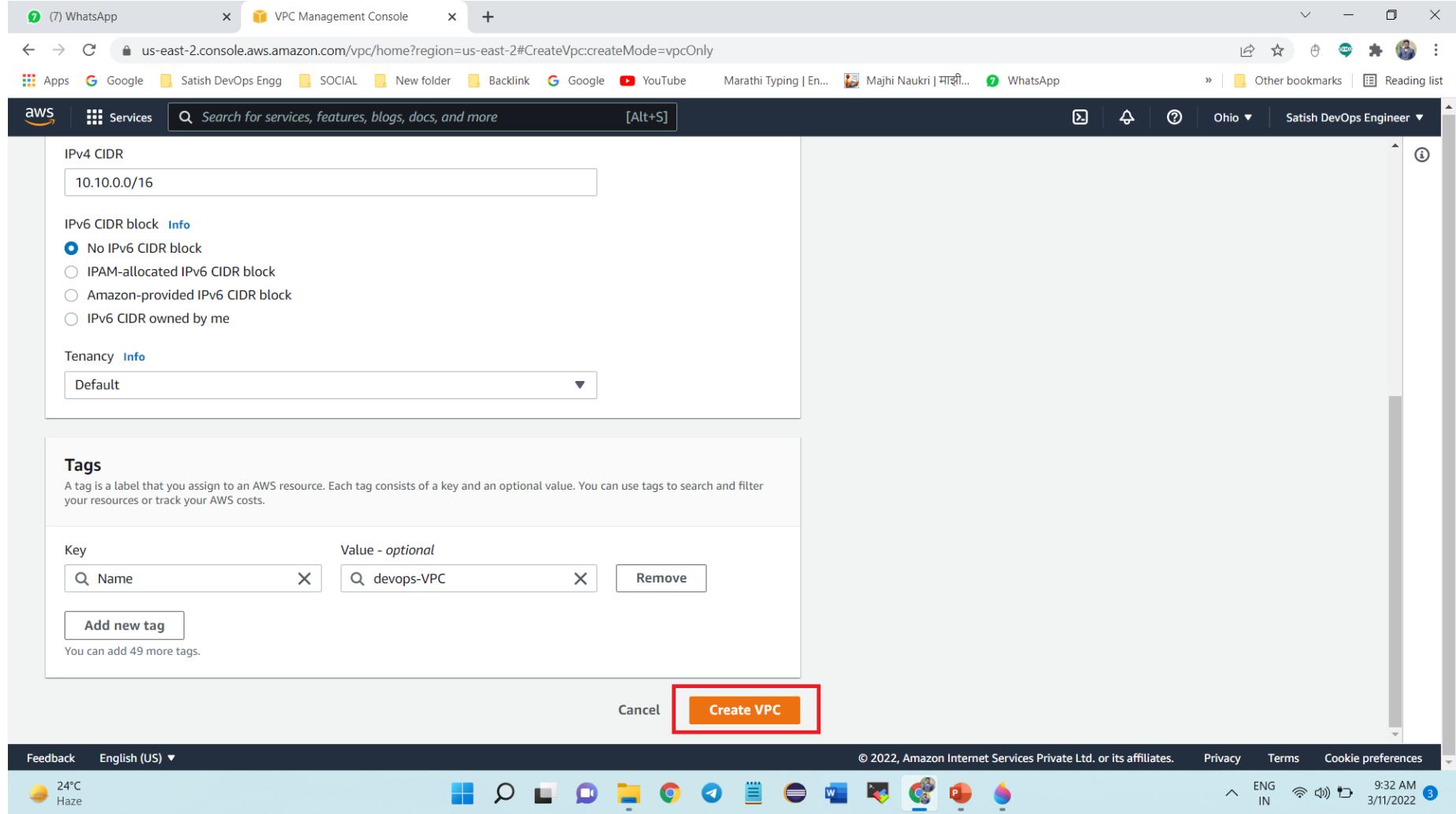
- Go to VPC
- Click on Create VPC

The screenshot shows the AWS VPC Management Console with the URL [us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#CreateVpc:createMode=vpcOnly](https://us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#CreateVpc:createMode=vpcOnly). The browser tab is titled "VPC Management Console". The main content area is titled "Create VPC" and contains the following fields:

- VPC settings**
- Resources to create**: A radio button group where "VPC only" is selected (highlighted with a red box).
- Name tag - optional**: A text input field containing "devops-VPC" (highlighted with a red box).
- IPv4 CIDR block**: A radio button group where "IPv4 CIDR manual input" is selected (highlighted with a red box). Below it, the "IPv4 CIDR" input field contains "10.10.0.0/16" (highlighted with a red box).
- IPv6 CIDR block**: A radio button group where "No IPv6 CIDR block" is selected (highlighted with a red box).

At the bottom of the page, there are links for "Feedback", "English (US)", "Privacy", "Terms", and "Cookie preferences". The status bar at the bottom right shows the date and time as "9:31 AM 3/11/2022".

- Give tag
- Enter proper CIDR as per requirement



- Click on Create VPC

The screenshot shows the AWS VPC Management Console interface. At the top, there is a success message: "You successfully created vpc-0e1ea03ae4ce0d752 / devops-VPC". The main content area displays the details of the newly created VPC, including its ID, state, and various network settings. The VPC ID is vpc-0e1ea03ae4ce0d752, and it is currently Available. The State column also indicates that DNS hostnames are disabled and DNS resolution is enabled. The DHCP options set is dopt-0abddda61d15017c, and the Main route table is rtb-0ce45cd7130c22a95. The Default VPC setting is No, with the IPv4 CIDR being 10.10.0.0/16. The Route 53 Resolver DNS Firewall rule groups section shows a single entry for owner ID 876283541003. The bottom navigation bar includes tabs for CIDRs, Flow logs, and Tags, with CIDRs currently selected.

VPC ID	State	DNS hostnames	DNS resolution
vpc-0e1ea03ae4ce0d752	Available	Disabled	Enabled

Tenancy	DHCP options set	Main route table	Main network ACL
Default	dopt-0abddda61d15017c	rtb-0ce45cd7130c22a95	acl-0c1d6fc4d05d6d57d

Default VPC	IPv4 CIDR	IPv6 pool	IPv6 CIDR
No	10.10.0.0/16	-	-

Route 53 Resolver DNS Firewall rule groups	Owner ID
-	876283541003

- Our VPC Created Successfully

**Now we have to create Subnet**

The screenshot shows the AWS VPC Management Console with the URL [us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#subnets](https://us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#subnets). The left sidebar under 'VIRTUAL PRIVATE CLOUD' has 'Subnets' selected, which is highlighted with a red box. The main content area displays a table titled 'Subnets (3) Info' with three rows of subnet data. The 'Create subnet' button in the top right corner is also highlighted with a red box.

Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR
-	subnet-0a84a11858506eb19	Available	vpc-0d530da491583e01c	172.31.32.0/20	-
-	subnet-04bb880c3944e9026	Available	vpc-0d530da491583e01c	172.31.0.0/20	-
-	subnet-0d94ff13f84c09eb1	Available	vpc-0d530da491583e01c	172.31.16.0/20	-

- Go to Subnets
- Click on Create Subnet

The screenshot shows a web browser window with the AWS VPC Management Console open. The URL is `us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#CreateSubnet`. The page title is "Create subnet". The "VPC ID" section is highlighted with a red box around the dropdown menu, which contains the placeholder text "Select a VPC". Below this, the "Subnet settings" section is visible, containing a message "Specify the CIDR blocks and Availability Zone for the subnet." and a note "Select a VPC first to create new subnets." A button labeled "Add new subnet" is present. At the bottom, there are "Cancel" and "Create subnet" buttons. The browser's address bar shows other tabs like WhatsApp and VPC Management Console, and the search bar has "Search for services, features, blogs, docs, and more". The bottom of the screen includes a navigation bar with links for Feedback, English (US), Privacy, Terms, and Cookie preferences, along with system status icons for weather (24°C Haze), language (ENG IN), battery, signal, and date/time (9:54 AM 3/11/2022).

- Select our own created VPC

9 (9) WhatsApp x VPC Management Console x + v - □ x

← → ⌂ 🔒 us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#CreateSubnet:

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aws Services Search for services, features, blogs, docs, and more [Alt+S]

## Create subnet Info

**VPC**

**VPC ID**  
Create subnets in this VPC.

**Associated VPC CIDRs**

IPv4 CIDRs  
10.10.0.0/16

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

**Subnet 1 of 1**

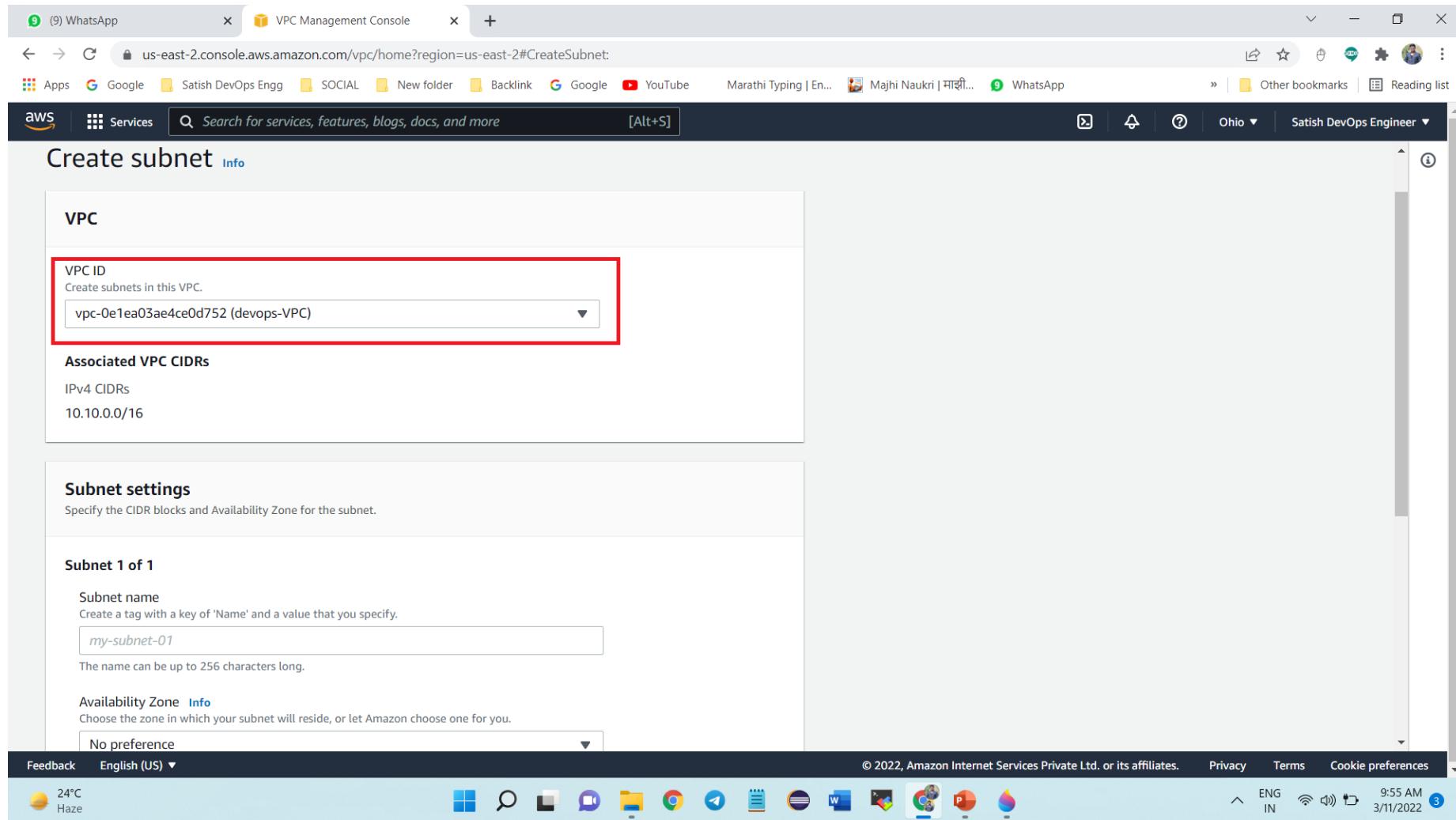
**Subnet name**  
Create a tag with a key of 'Name' and a value that you specify.

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.

Feedback English (US) ▾ © 2022, Amazon Internet Services Private Ltd. or its affiliates. Privacy Terms Cookie preferences

24°C Haze ENG IN 9:55 AM 3/11/2022



The screenshot shows the AWS VPC Management Console with the URL [us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#CreateSubnet](https://us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#CreateSubnet). The page is titled "Subnet settings" and displays the configuration for "Subnet 1 of 1".

**Subnet name:** Public-Subnet (highlighted with a red box)

**Availability Zone:** US East (Ohio) / us-east-2a (highlighted with a red box)

**IPv4 CIDR block:** 10.10.1.0/24 (highlighted with a red box)

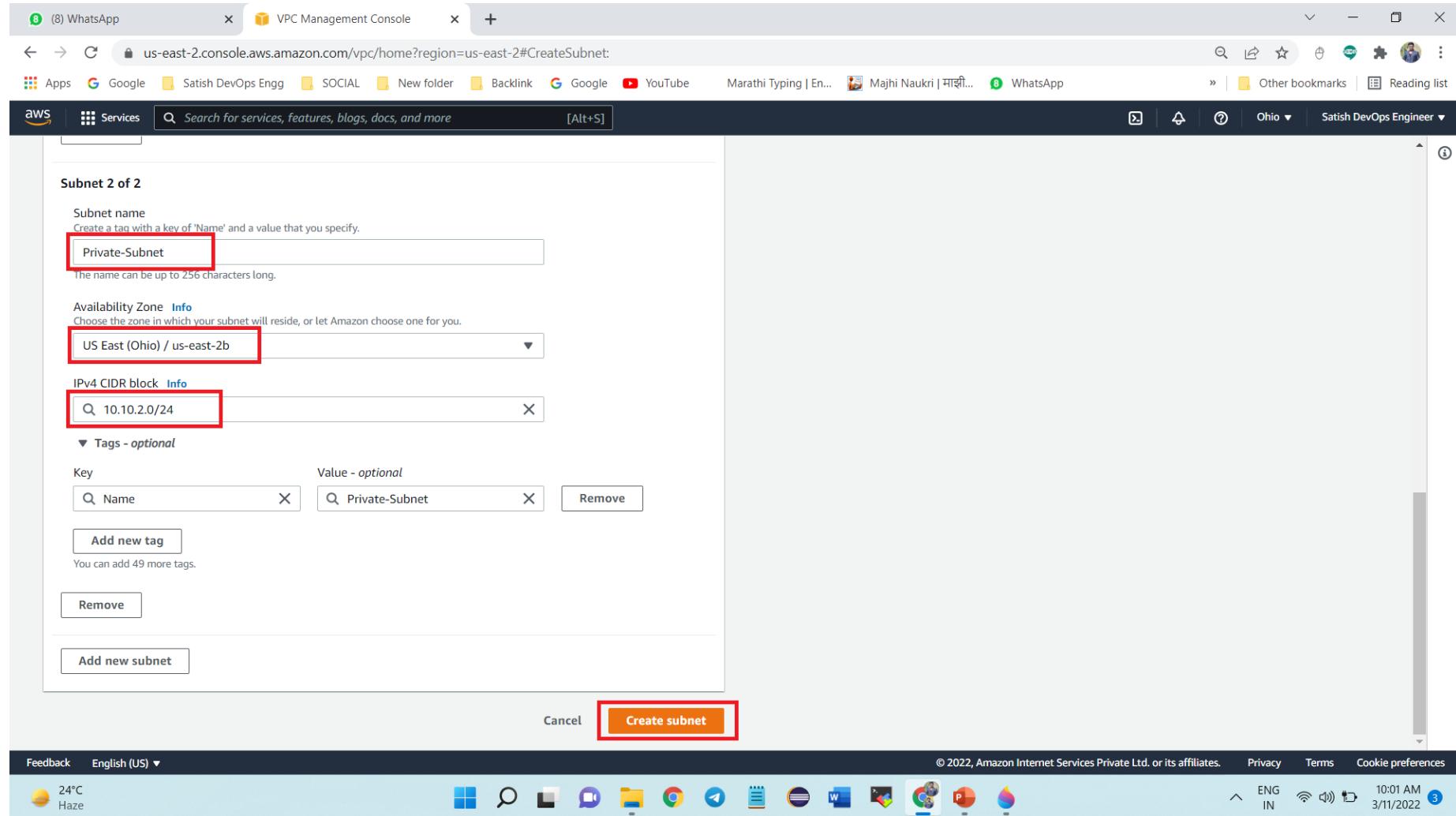
**Tags - optional:**

- Key: Name, Value: Public-Subnet
- Add new tag button
- You can add 49 more tags.
- Remove button

**Add new subnet** button (highlighted with a red box)

At the bottom, there are links for Feedback, English (US), Privacy, Terms, and Cookie preferences. The status bar shows the date (3/11/2022), time (9:59 AM), and battery level (3).

- **Give Subnet Name as Public**
- **Select AZ**
- **Enter proper CIDR for Subnet**
- **Click on Add New Subnet**



- Give Subnet Name as Private
- Select AZ
- Enter proper CIDR for Subnet

The screenshot shows the AWS VPC Management Console interface. The left sidebar is titled "VIRTUAL PRIVATE CLOUD" and includes sections for "Your VPCs", "Subnets", "Route Tables", "Internet Gateways", "Egress Only Internet Gateways", "DHCP Options Sets", "Elastic IPs", "Managed Prefix Lists", "Endpoints", "Endpoint Services", "NAT Gateways", and "Peering Connections". The "Subnets" section is currently selected. The main content area is titled "Subnets (2) Info" and displays a table of subnet information. The table has columns for Name, Subnet ID, State, VPC, IPv4 CIDR, IPv6 CIDR, and Available IPv4. Two subnets are listed: "Public-Subnet" (Subnet ID: subnet-00c1a5d0a1e14e5fe) and "Private-Subnet" (Subnet ID: subnet-0c11c8dc0b1c4f38e). Both subnets are marked as "Available". The IPv4 CIDR ranges are 10.10.1.0/24 and 10.10.2.0/24 respectively, with 251 available IPv4 addresses each. A success message at the top states: "You have successfully created 2 subnets: subnet-00c1a5d0a1e14e5fe, subnet-0c11c8dc0b1c4f38e". The bottom navigation bar includes links for "Feedback", "English (US)", "Privacy", "Terms", and "Cookie preferences". It also shows the current weather as "24°C Haze" and the system time as "10:02 AM 3/11/2022".

Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR	Available IPv4
Public-Subnet	subnet-00c1a5d0a1e14e5fe	Available	vpc-0e1ea03ae4ce0d752   dev...	10.10.1.0/24	-	251
Private-Subnet	subnet-0c11c8dc0b1c4f38e	Available	vpc-0e1ea03ae4ce0d752   dev...	10.10.2.0/24	-	251

- Here our both subnets created successfully

**Now we have to create  
Internet Gateway**

The screenshot shows the AWS VPC Management Console interface. The left sidebar is expanded to show the 'Virtual Private Cloud' section, with 'Internet Gateways' highlighted by a red box. The main content area displays the 'Internet gateways (1/1)' page. At the top right of this area, there is a red box around the 'Create internet gateway' button. The table below lists one internet gateway entry:

Name	Internet gateway ID	State	VPC ID	Owner
-	igw-034f938d902beb887	Attached	vpc-0d530da491583e01c	876283541003

Below the table, a detailed view for the gateway 'igw-034f938d902beb887' is shown, with tabs for 'Details' and 'Tags'. The 'Details' tab displays the following information:

Internet gateway ID	State	VPC ID	Owner
igw-034f938d902beb887	Attached	vpc-0d530da491583e01c	876283541003

At the bottom of the page, there are standard footer links and a weather widget indicating 24°C Haze.

- Go to Internet Gateways
- Click on Create Internet Gateway

8 WhatsApp | Subnets | VPC Management Con... | Create internet gateway | VPC M... + us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#CreateInternetGateway:

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AWS Services Search for services, features, blogs, docs, and more [Alt+S]

VPC > Internet gateways > Create internet gateway

## Create internet gateway Info

An internet gateway is a virtual router that connects a VPC to the internet. To create a new internet gateway specify the name for the gateway below.

**Internet gateway settings**

Name tag  
Creates a tag with a key of 'Name' and a value that you specify.

Devops-IGW

**Tags - optional**  
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

Key Value - optional

Name Devops-IGW Remove

Add new tag

You can add 49 more tags.

Cancel Create internet gateway

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24°C Haze ENG IN 10:03 AM 3/11/2022

- Give Name Tag
  - Click on Create Internet Gateway

The screenshot shows the AWS VPC Management Console with the URL [us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#InternetGateway:internetGatewayId=igw-0aec85fb3ccf20d7b](https://us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#InternetGateway:internetGatewayId=igw-0aec85fb3ccf20d7b). A success message at the top states: "The following internet gateway was created: igw-0aec85fb3ccf20d7b - Devops-IGW. You can now attach to a VPC to enable the VPC to communicate with the internet." Below this, the Internet gateway details are shown: Internet gateway ID is igw-0aec85fb3ccf20d7b, State is Detached, VPC ID is -, and Owner is 876283541003. The "Actions" button is highlighted with a red box. The left sidebar shows the navigation path: VPC Dashboard > Internet gateways > igw-0aec85fb3ccf20d7b / Devops-IGW.

- Our Internet gateway is created successfully
- But it state is Detached
- Click on Actions

The following internet gateway was created: igw-0aec85fb3ccf20d7b - Devops-IGW. You can now attach to a VPC to enable the VPC to communicate with the internet.

Attach to a VPC

igw-0aec85fb3ccf20d7b / Devops-IGW

Details Info

Internet gateway ID igw-0aec85fb3ccf20d7b	State Detached	VPC ID -	Owner 876283541003
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Tags

Key	Value
Name	Devops-IGW

Actions

- Attach to VPC
- Detach from VPC
- Manage tags
- Delete

Feedback English (US) ▾

24°C Haze

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ENG IN 10:04 AM 3/11/2022 3

- Click on Attach to VPC

The screenshot shows a browser window with multiple tabs open, including WhatsApp, Subnets | VPC Management Consoles, and Attach internet gateway | VPC Management Consoles. The main content is the 'Attach to VPC' dialog for an internet gateway. The dialog title is 'Attach to VPC (igw-0aec85fb3ccf20d7b)'. It has a 'VPC' section with instructions to attach an internet gateway to a VPC. A dropdown menu titled 'Select a VPC' lists 'vpc-0e1ea03ae4ce0d752 - devops-VPC'. Below the dropdown are 'Cancel' and 'Attach internet gateway' buttons. The 'Attach internet gateway' button is highlighted with a blue border. The browser's address bar shows the URL: us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#AttachInternetGateway:internetGatewayId=igw-0aec85fb3ccf20d7b. The top navigation bar includes links for Apps, Google, Sathish DevOps Engg, SOCIAL, New folder, Backlink, Google, YouTube, Marathi Typing | En..., Majhi Naukri | माझी... WhatsApp, and Other bookmarks.

- Select our created VPC
- Click on Attach Internet gateway

The screenshot shows the AWS VPC Management Console interface. The top navigation bar includes tabs for WhatsApp, Subnets | VPC Management Console, and VPC Management Console. The URL in the address bar is `us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#InternetGateway:internetGatewayId=igw-0aec85fb3ccf20d7b`. The search bar contains the placeholder "Search for services, features, blogs, docs, and more". The top right corner shows user information for "Satish DevOps Engg" and "Ohio".

The left sidebar menu is expanded under "VIRTUAL PRIVATE CLOUD" and "Internet Gateways". The main content area displays the details of an Internet Gateway named "igw-0aec85fb3ccf20d7b / Devops-IGW". The "Details" tab is selected, showing the following information:

Internet gateway ID	State	VPC ID	Owner
igw-0aec85fb3ccf20d7b	Attached	vpc-0e1ea03ae4ce0d752   devops-VPC	876283541003

The "Tags" section shows one tag: "Name" with the value "Devops-IGW". A success message at the top of the page states: "Internet gateway igw-0aec85fb3ccf20d7b successfully attached to vpc-0e1ea03ae4ce0d752".

The bottom of the screen includes a footer with links for Feedback, English (US), Privacy, Terms, and Cookie preferences. It also displays the current weather (27°C Haze), system icons, and the date/time (10:07 AM 3/11/2022).

- It is now attached successfully

**Now we have to create Route Table**

The screenshot shows the AWS VPC Management Console interface. The left sidebar is titled 'VIRTUAL PRIVATE CLOUD' and includes links for 'Your VPCs', 'Subnets', and 'Route Tables'. The 'Route Tables' link is highlighted with a red box. The main content area displays a table titled 'Route tables (2)'. The table has columns for Name, Route table ID, Explicit subnet associations, Edge associations, Main, VPC, and Owner. Two route tables are listed:

Name	Route table ID	Explicit subnet associations	Edge associations	Main	VPC	Owner
-	rtb-0ce45cd7130c22a95	-	-	Yes	vpc-0e1ea03ae4ce0d752   dev...	87628.
-	rtb-0592c01d7b6bc984f	-	-	Yes	vpc-0d530da491583e01c	87628.

A large 'Select a route table' section is visible below the table. The top right of the main area contains a 'Create route table' button, which is also highlighted with a red box.

- Go to Route Table
- Click on Create Route Table

The screenshot shows a browser window with multiple tabs open, including WhatsApp, Subnets | VPC Management Console, and VPC Management Console. The main content is the 'Create route table' page. The 'Route table settings' section has a 'Name - optional' field containing 'Public-Routing' and a 'VPC' dropdown set to 'vpc-0e1ea03ae4ce0d752 (devops-VPC)'. The 'Tags' section contains a single tag 'Name: Public-Routing'. At the bottom, there is a 'Cancel' button and a prominent orange 'Create route table' button.

Route table settings

Name - optional  
Create a tag with a key of 'Name' and a value that you specify.

Public-Routing

VPC  
The VPC to use for this route table.

vpc-0e1ea03ae4ce0d752 (devops-VPC)

Tags

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

Key Value - optional

Name: Public-Routing

Add new tag

You can add 49 more tags.

Create route table

- Give Name as Public because we are using it with Internet gateway
- Select Our VPC
- Click on Create Route table

The screenshot shows the AWS VPC Management Console interface. The top navigation bar includes tabs for WhatsApp, Subnets, VPC Management Console, and another VPC Management Console tab. The main search bar contains the query "Route table rtb-06f83db7355a8ad75 | Public-Routing was created successfully.". The left sidebar lists various VPC services: VPC Dashboard, EC2 Global View, Filter by VPC, Select a VPC, VIRTUAL PRIVATE CLOUD (Your VPCs, Subnets), Route Tables (Internet Gateways, Egress Only Internet Gateways, DHCP Options Sets, Elastic IPs, Managed Prefix Lists, Endpoints, Endpoint Services, NAT Gateways, Peering Connections), and SECURITY (Feedback, English (US)). The main content area displays the details of a route table named "rtb-06f83db7355a8ad75 / Public-Routing". A green success message box is highlighted with a red border. Below it, a message says "You can now check network connectivity with Reachability Analyzer" with a "Run Reachability Analyzer" button. The "Details" tab is selected, showing the following information:

Route table ID	Main	Explicit subnet associations	Edge associations
rtb-06f83db7355a8ad75	No	-	-
VPC	Owner ID		
vpc-0e1ea03ae4ce0d752   devops-VPC	876283541003		

The "Routes" tab is active, showing one route entry: "Routes (1)". At the bottom, there are links for Feedback, English (US), Privacy, Terms, and Cookie preferences, along with system status icons like weather (27°C Haze), language (ENG IN), battery, signal, and date/time (10:10 AM 3/11/2022).

- It is created Successfully

The screenshot shows the AWS VPC Management Console interface. The left sidebar is titled "Route Tables" and is highlighted with a red box. The main content area displays a table of "Route tables (1/3)". One row, "Public-Routing", is selected and highlighted with a red box. The "Routes" tab in the sub-table details view is also highlighted with a red box. An "Edit routes" button in the same view is also highlighted with a red box.

Name	Route table ID	Explicit subnet associat...	Edge associations	Main	VPC	Ow...
rtb-0ce45cd7130c22a95	-	-	-	Yes	vpc-0e1ea03ae4ce0d752   dev...	87628.
<b>Public-Routing</b>	<b>rtb-06f83db7355a8ad75</b>	-	-	No	vpc-0e1ea03ae4ce0d752   dev...	87628.
-	rtb-0592c01d7b6bc984f	-	-	Yes	vpc-0d530da491583e01c	87628.

**rtb-06f83db7355a8ad75 / Public-Routing**

Details **Routes** Subnet associations Edge associations Route propagation Tags

**Routes (1)**

Destination Target Status Propagated

10.10.0.0/16	local	Active	No
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Edit routes

- Go to Route Tables again
- Select our Public Route Table
- Click on Routes
- Click on Edit Routes

The screenshot shows a browser window with multiple tabs open, including WhatsApp, Subnets | VPC Management Console, and VPC Management Console. The main content is the AWS VPC Management Console, specifically the 'Edit routes' section for a route table named 'rtb-06f83db7355a8ad75'. The table has one existing route entry:

Destination	Target	Status	Propagated
10.10.0.0/16	local	Active	No

A red box highlights the 'Add route' button at the bottom left of the table. At the bottom of the page, there are 'Cancel', 'Preview', and 'Save changes' buttons. The browser's address bar shows the URL: us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#EditRoutes:RouteTableId=rtb-06f83db7355a8ad75.

- Click on Add Route

The screenshot shows the AWS VPC Management Console with the URL [us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#EditRoutes:RouteTableId=rtb-06f83db7355a8ad75](https://us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#EditRoutes:RouteTableId=rtb-06f83db7355a8ad75). The page is titled 'Edit routes' under 'Route tables' for route table 'rtb-06f83db7355a8ad75'. The 'Destination' column contains '10.10.0.0/16' and '0.0.0.0/0'. The 'Target' column shows a dropdown menu with 'local' selected. The 'Status' column shows 'Active' and 'Propagated' is set to 'No'. A 'Remove' button is visible. Below the table, there is an 'Add route' button. On the right, there are 'Cancel', 'Preview', and 'Save changes' buttons. A search bar at the top has 'Search for services, features, blogs, docs, and more' and '[Alt+S]'. The bottom navigation bar includes links for Feedback, English (US), Privacy, Terms, and Cookie preferences, along with system status icons like weather (27°C Haze) and system time (10:21 AM 3/11/2022).

- Enter 0.0.0.0/0 in Destination
- Search internet gateway in Target

The screenshot shows the AWS VPC Management Console with the URL <https://us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#EditRoutes:RouteTableId=rtb-06f83db7355a8ad75>. The page title is "Edit routes". The table contains the following data:

Destination	Target	Status	Propagated
10.10.0.0/16	local	Active	No
0.0.0.0/0	igw-0aec85fb3ccf20d7b (Devops-IGW)	-	No

Buttons at the bottom include "Add route", "Remove", "Cancel", "Preview", and "Save changes". The "Save changes" button is highlighted in orange.

At the bottom of the browser window, there is a toolbar with various icons and a status bar showing "27°C Haze", "ENG IN", "10:22 AM 3/11/2022", and "Cookie preferences".

- Select your Internet gateway

The screenshot shows the AWS VPC Management Console with the URL <https://us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#EditRoutes:RouteTableId=rtb-06f83db7355a8ad75>. The page title is "Edit routes". The main content is a table with columns: Destination, Target, Status, and Propagated. There are two rows in the table.

Destination	Target	Status	Propagated
10.10.0.0/16	local	Active	No
0.0.0.0/0	igw-0aec85fb3ccf20d7b	-	No

At the bottom right of the dialog, there are three buttons: "Cancel", "Preview", and "Save changes". The "Save changes" button is highlighted with a red box.

- Click on Save Changes

The screenshot shows the AWS VPC Management Console interface. The top navigation bar includes tabs for WhatsApp, Subnets | VPC Management Console, VPC Management Console, and another VPC Management Console tab. The URL in the address bar is `us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#RouteTableDetails:RouteTableId=rtb-06f83db7355a8ad75`. The left sidebar has sections for New VPC Experience, VPC Dashboard, EC2 Global View, Filter by VPC (with a dropdown for Select a VPC), VIRTUAL PRIVATE CLOUD (Your VPCs, Subnets, Route Tables selected), Internet Gateways, Egress Only Internet Gateways, DHCP Options Sets, Elastic IPs, Managed Prefix Lists, Endpoints, Endpoint Services, NAT Gateways, and Peering Connections. Below these are sections for SECURITY (Feedback, English (US)), a weather widget (27°C Haze), and a taskbar with various icons. The main content area displays a green success message: "Updated routes for rtb-06f83db7355a8ad75 / Public-Routing successfully" with a "Details" link. The breadcrumb navigation shows VPC > Route tables > rtb-06f83db7355a8ad75. The title is "rtb-06f83db7355a8ad75 / Public-Routing". The "Details" tab is selected, showing route table ID (rtb-06f83db7355a8ad75), Main (No), Explicit subnet associations (none), Edge associations (none), VPC (vpc-0e1ea03ae4ce0d752 | devops-VPC), Owner ID (876283541003), and Tags (none). The "Routes" tab is active, showing two routes (both to 10.0.0.0/16 via igw-0e1ea03ae4ce0d752) with an "Edit routes" button. The footer contains copyright information (© 2022, Amazon Internet Services Private Ltd. or its affiliates.), links for Privacy, Terms, and Cookie preferences, and system status (ENG IN, 10:23 AM, 3/11/2022).

- We have added entry of IGW in Route Table successfully.

The screenshot shows the AWS VPC Management Console with the URL <https://us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#RouteTables>. The left sidebar is expanded, showing the 'Route Tables' option under the 'VIRTUAL PRIVATE CLOUD' section, which is highlighted with a red box. The main content area displays a table titled 'Route tables (1/3)'. The table has columns: Name, Route table ID, Explicit subnet associat..., Edge associations, Main, VPC, and Owner. There are three rows: 'rtb-0ce45cd7130c22a95' (Main, Yes, vpc-0e1ea03ae4ce0d752 | dev..., 87628.), 'rtb-06f83db7355a8ad75' (No, vpc-0e1ea03ae4ce0d752 | dev..., 87628.), and 'rtb-0592c01d7b6bc984f' (Yes, vpc-0d530da491583e01c, 87628.). The row 'rtb-06f83db7355a8ad75 / Public-Routing' is selected, indicated by a checked checkbox in the 'Name' column. The 'Subnet associations' tab is active, highlighted with a red box. Below it, there is a section titled 'Explicit subnet associations (0)' with a search bar and a 'Find subnet association' button. A red box highlights the 'Edit subnet associations' button. The bottom of the screen shows the browser's address bar, status bar (27°C Haze), and various system icons.

- Go to Route Tables again
- Select our Public Route Table
- Click on Subnet Associations
- Click on Edit Subnet Associations

VPC > Route tables > rtb-06f83db7355a8ad75 > Edit subnet associations

## Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (1/2)					
	Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
<input checked="" type="checkbox"/>	Public-Subnet	subnet-00c1a5d0a1e14e5fe	10.10.1.0/24	-	Main (rtb-0ce45cd7130c22a95)
<input type="checkbox"/>	Private-Subnet	subnet-0c11c8dc0b1c4f38e	10.10.2.0/24	-	Main (rtb-0ce45cd7130c22a95)

**Selected subnets**

subnet-00c1a5d0a1e14e5fe / Public-Subnet X

Cancel **Save associations**

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27°C Haze ENG IN 10:24 AM 3/11/2022 3

- Select your Public Subnet
- Click on Save Associations

The screenshot shows the AWS VPC Management Console interface. The top navigation bar includes tabs for WhatsApp, Subnets, VPC Management Console, and Route tables. The main content area displays a success message: "You have successfully updated subnet associations for rtb-06f83db7355a8ad75 / Public-Routing." Below this, a table lists three route tables:

Name	Route table ID	Explicit subnet associat...	Edge associations	Main	VPC	Ow...
-	rtb-0ce45cd7130c22a95	-	-	Yes	vpc-0e1ea03ae4ce0d752   dev...	87628.
Public-Routing	rtb-06f83db7355a8ad75	subnet-00c1a5d0a1e14...	-	No	vpc-0e1ea03ae4ce0d752   dev...	87628.
-	rtb-0592c01d7b6bc984f	-	-	Yes	vpc-0d530da491583e01c	87628.

The left sidebar shows the navigation menu for VPC management, including options like VPC Dashboard, EC2 Global View, Filter by VPC, and various sub-options under Route Tables, Internet Gateways, Egress Only Internet Gateways, DHCP Options Sets, Elastic IPs, Managed Prefix Lists, Endpoints, Endpoint Services, NAT Gateways, and Peering Connections.

- We have associated subnet successfully.

**Now we have to create NAT Gateway**

The screenshot shows the AWS VPC Management Console interface. The top navigation bar includes tabs for WhatsApp, Subnets | VPC Management, VPC Management Console, NAT gateways | VPC Management, Instances | EC2 Management, and other browser tabs like Google and YouTube. The main search bar says "Search for services, features, blogs, docs, and more". On the left sidebar under "VPC Dashboard", the "NAT Gateways" link is highlighted with a red box. The main content area is titled "NAT gateways" and shows a table with columns: Name, NAT gateway ID, Connectivity, State, State message, Elastic IP address, and Private IP address. A search bar at the top of the table says "Filter NAT gateways". The "Actions" dropdown menu is visible, and the "Create NAT gateway" button is also highlighted with a red box.

- Go to NAT Gateways
- Click on Create NAT Gateway

The screenshot shows the AWS VPC Management Console with the URL [us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#CreateNatGateway](https://us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#CreateNatGateway). The page is titled "Create NAT gateway".

**NAT gateway settings**

**Name - optional**  
Create a tag with a key of 'Name' and a value that you specify.  
Mission-AWS-NAT-Gateway

**Subnet**  
Select a subnet in which to create the NAT gateway.

subnet-00c1a5d0a1e14e5fe (Public-Subnet)  
subnet-0a84a11858506eb19  
subnet-00c1a5d0a1e14e5fe (Public-Subnet)  
subnet-0c11c8dc0b1c4f38e (Private-Subnet)  
subnet-04bb880c3944e9026  
subnet-0d94ff13f84c09eb1

Allocate Elastic IP

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- Give Name
- Select Your Public Subnet

The screenshot shows a browser window with multiple tabs open, including WhatsApp, Subnets | VPC Management, VPC Management Console, NAT gateways | VPC Management, VPC Management Console, Instances | EC2 Management, and another VPC Management Console tab. The main content area is titled "NAT gateway settings".

**Name - optional:**  
Create a tag with a key of 'Name' and a value that you specify.  
Mission-AWS-NAT-Gateway

**Subnet:**  
Select a subnet in which to create the NAT gateway.  
subnet-00c1a5d0a1e14e5fe (Public-Subnet)

**Connectivity type:**  
Select a connectivity type for the NAT gateway.  
 Public  
 Private

**Elastic IP allocation ID:** eipalloc-0f3065f9e0ec3c714

**Tags:**  
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

**Buttons:**  
Allocate Elastic IP

**Footer:**  
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- Click on Allocate Elastic IP

The screenshot shows the AWS VPC Management Console interface for creating a NAT gateway. The browser tab is titled "us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#CreateNatGateway". The main form has the following fields:

- Subnet:** A dropdown menu set to "subnet-00c1a5d0a1e14e5fe (Public-Subnet)".
- Connectivity type:** A radio button group where "Public" is selected.
- Elastic IP allocation ID:** A dropdown menu set to "eipalloc-0f3065f9e0ec3c714". To its right is a "Allocate Elastic IP" button.

Below the form is a "Tags" section with a key-value pair: "Name" and "Mission-AWS-NAT-Gateway". There is also an "Add new tag" button and a note that 49 more tags can be added.

At the bottom of the form are "Cancel" and "Create NAT gateway" buttons, with the latter being highlighted by a red box.

The browser's address bar shows the URL "us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#CreateNatGateway". The search bar contains "Search for services, features, blogs, docs, and more". The top navigation bar includes links for "Services", "Search", "[Alt+S]", and user information for "Satish DevOps Engineer".

- Click on create NAT Gateway

The screenshot shows the AWS VPC Management Console interface. The top navigation bar includes tabs for Subnets, VPC Management, NAT gateways, and Instances. The main content area displays a success message: "NAT gateway nat-02df3b9395fabe2ea | Mission-AWS-NAT-Gateway was created successfully." Below this, the "nat-02df3b9395fabe2ea / Mission-AWS-NAT-Gateway" details are shown in a table format. The table includes columns for NAT gateway ID, Connectivity type, State, State message, Elastic IP address, Private IP address, Network interface ID, Subnet, and Created date. The "Monitoring" tab is selected at the bottom of the page.

NAT gateway ID	Connectivity type	State	State message
nat-02df3b9395fabe2ea	Public	Pending	-
Elastic IP address	Private IP address	Network interface ID	VPC
-	-	-	vpc-0e1ea03ae4ce0d752 / devops-VPC
Subnet	Created	Deleted	
subnet-00c1a5d0a1e14e5fe / Public-Subnet	Friday, March 11, 2022, 11:58:15 GMT+5:30	-	

- We have created NAT Gateway Successfully.

**Now we have to create  
Route Table for NAT Gateway**

The screenshot shows the AWS VPC Management Console interface. The left sidebar is titled 'VIRTUAL PRIVATE CLOUD' and includes links for 'Your VPCs', 'Subnets', and 'Route Tables'. The 'Route Tables' link is highlighted with a red box. The main content area displays a table titled 'Route tables (3)' with columns for Name, Route table ID, Explicit subnet associat..., Edge associations, Main, VPC, and Owner. Three route tables are listed: 'rtb-0ce45cd7130c22a95', 'Public-Routing', and 'rtb-0592c01d7b6bc984f'. A large orange button labeled 'Create route table' is located at the top right of the table area. The browser address bar shows the URL: us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#RouteTables.

Name	Route table ID	Explicit subnet associat...	Edge associations	Main	VPC	Owner
-	rtb-0ce45cd7130c22a95	-	-	Yes	vpc-0e1ea03ae4ce0d752   dev...	87628.
Public-Routing	rtb-06f83db7355a8ad75	subnet-00c1a5d0a1e14...	-	No	vpc-0e1ea03ae4ce0d752   dev...	87628.
-	rtb-0592c01d7b6bc984f	-	-	Yes	vpc-0d530da491583e01c	87628.

- Go to Route Table
- Click on Create Route Table

The screenshot shows the AWS VPC Management Console with the URL [us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#CreateRouteTable](https://us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#CreateRouteTable). The page is titled 'Create route table' and contains the following fields:

- Route table settings:**
  - Name - optional:** A text input field containing 'Route-Table-For-Nat-Gateway'.
  - VPC:** A dropdown menu showing 'vpc-0e1ea03ae4ce0d752 (devops-VPC)'.
- Tags:**
  - A table with one row: Key 'Name' and Value 'Route-Table-For-Nat-Gateway'.
  - An 'Add new tag' button.
  - A note: 'You can add 49 more tags.'

At the bottom right of the form is a large orange button labeled 'Create route table'.

- Give name properly because we are creating this route table for NAT Gateway
- Select our created VPC
- Click on Create Route Table

The screenshot shows the AWS VPC Management Console with the URL [us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#RouteTables](https://us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#RouteTables). The left sidebar is collapsed, and the main area displays the 'Route tables' list. A green success message at the top states: 'Route table rtb-0b138b038eb41ffe4 | Route-Table-For-Nat-Gateway was created successfully.' The 'Route Tables' section is highlighted with a red box. The 'Routes' tab is selected in the sub-menu, and the 'Edit routes' button is also highlighted with a red box.

Name	Route table ID	Explicit subnet associat...	Edge associations	Main	VPC
-	rtb-0ce45cd7130c22a95	-	-	Yes	vpc-0e1ea03ae4ce0d752   dev...
Public-Routing	rtb-06f83db7355a8ad75	subnet-00c1a5d0a1e14...	-	No	vpc-0e1ea03ae4ce0d752   dev...
-	rtb-0592c01d7b6bc984f	-	-	Yes	vpc-0d530da491583e01c
<input checked="" type="checkbox"/> Route-Table-For-Nat-Gateway	rtb-0b138b038eb41ffe4	-	-	No	vpc-0e1ea03ae4ce0d752   dev...

- Go to Route Tables again
- Select our NAT Gateway Route Table
- Click on Routes
- Click on Edit Routes

VPC > Route tables > rtb-0b138b038eb41ffe4 > Edit routes

## Edit routes

Destination	Target	Status	Propagated
10.10.0.0/16	local	Active	No
0.0.0.0/0	Egress Only Internet Gateway Gateway Load Balancer Endpoint Instance Internet Gateway local NAT Gateway Network Int NAT Gateway Outpost Local Gateway Peering Connection Transit Gateway Virtual Private Gateway	-	No

Add route Remove

Cancel Preview Save changes

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- Enter 0.0.0.0/0 in Destination
- Search NAT Gateway in Target

VPC > Route tables > rtb-0b138b038eb41ffe4 > Edit routes

## Edit routes

Destination	Target	Status	Propagated
10.10.0.0/16	local	Active	No
0.0.0.0/0	<input type="text" value="nat"/> nat-02df3b9395fafe2ea (Mission-AWS-NAT-Gateway)	-	No

Add route

Cancel Preview Save changes

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- Select your NAT Gateway

The screenshot shows the AWS VPC Management Console with the URL [us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#EditRoutes:RouteTableId=rtb-0b138b038eb41ffe4](https://us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#EditRoutes:RouteTableId=rtb-0b138b038eb41ffe4). The page displays the 'Edit routes' section for a route table with the ID `rtb-0b138b038eb41ffe4`. The table has four columns: Destination, Target, Status, and Propagated. There are two entries:

Destination	Target	Status	Propagated
10.10.0.0/16	local	Active	No
0.0.0.0/0	nat-02df3b9395fabe2ea	-	No

At the bottom right, there are three buttons: 'Cancel', 'Preview' (disabled), and 'Save changes' (highlighted in orange). The browser's address bar also shows the same URL.

- Click on Save Changes

The screenshot shows the AWS VPC Management Console interface. The top navigation bar includes tabs for Subnets, VPC Management, NAT gateways, VPC Management, Instances, and EC2 Management. The main content area displays a success message: "Updated routes for rtb-0b138b038eb41ffe4 / Route-Table-For-Nat-Gateway successfully". Below this, the "rtb-0b138b038eb41ffe4 / Route-Table-For-Nat-Gateway" details are shown, including its ID, association status, and owner information. The "Routes" tab is selected, showing two routes. At the bottom, there are footer links for Feedback, English (US), Privacy, Terms, and Cookie preferences, along with system status icons.

- We have updated route table for NAT Gateway Successfully.

The screenshot shows the AWS VPC Management Console with the URL <https://us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#RouteTables>. The left sidebar is collapsed, and the main area displays the 'Route tables' section. A green success message box at the top states: 'Updated routes for rtb-0b138b038eb41ffe4 / Route-Table-For-Nat-Gateway successfully'. Below it, a table lists four route tables, with the fourth one, 'Route-Table-For-Nat-Gateway', selected and highlighted with a red box. The table columns include Name, Route table ID, Explicit subnet associations, Edge associations, Main, and VPC. The 'Route-Table-For-Nat-Gateway' row has an empty 'Explicit subnet associations' field. At the bottom of the page, there is a 'Subnet associations' tab highlighted with a red box, and a 'Edit subnet associations' button also highlighted with a red box.

Name	Route table ID	Explicit subnet associations	Edge associations	Main	VPC
-	rtb-0ce45cd7130c22a95	-	-	Yes	vpc-0e1ea03ae4ce0d752   dev...
Public-Routing	rtb-06f83db7355a8ad75	subnet-00c1a5d0a1e14...	-	No	vpc-0e1ea03ae4ce0d752   dev...
-	rtb-0592c01d7b6bc984f	-	-	Yes	vpc-0d530da491583e01c
<b>Route-Table-For-Nat-Gateway</b>	<b>rtb-0b138b038eb41ffe4</b>			No	vpc-0e1ea03ae4ce0d752   dev...

- Go to Route Tables again
- Select our NAT Gateway Route Table
- Click on Subnet Associations
- Click on Edit Subnet Associations

VPC > Route tables > rtb-0b138b038eb41ffe4 > Edit subnet associations

## Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (1/2)					
Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID	
<input type="checkbox"/> Public-Subnet	subnet-00c1a5d0a1e14e5fe	10.10.1.0/24	-	rtb-06f83db7355a8ad75 / Public-Routing	
<input checked="" type="checkbox"/> Private-Subnet	subnet-0c11c8dc0b1c4f38e	10.10.2.0/24	-	Main (rtb-0ce45cd7130c22a95)	

**Selected subnets**

subnet-0c11c8dc0b1c4f38e / Private-Subnet

**Save associations**

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- Select Private Subnet
- Click on Save Associations

The screenshot shows the AWS VPC Management Console interface. At the top, there are several tabs: WhatsApp, Subnets | VPC Management, VPC Management Console, NAT gateways | VPC Management, Route tables | VPC Management, Instances | EC2 Management, and others. The URL in the address bar is [us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#RouteTables](https://us-east-2.console.aws.amazon.com/vpc/home?region=us-east-2#RouteTables). The navigation bar includes links for Apps, Google, Sash DevOps Engg, SOCIAL, New folder, Backlink, YouTube, Marathi Typing | En..., Majhi Naukri | माझी..., WhatsApp, Other bookmarks, and Reading list. The user is signed in as Sash DevOps Engineer.

A green success message box is displayed in the center: "You have successfully updated subnet associations for rtb-0b138b038eb41ffe4 / Route-Table-For-Nat-Gateway." Below this, the "Route tables (4)" section is shown with a table:

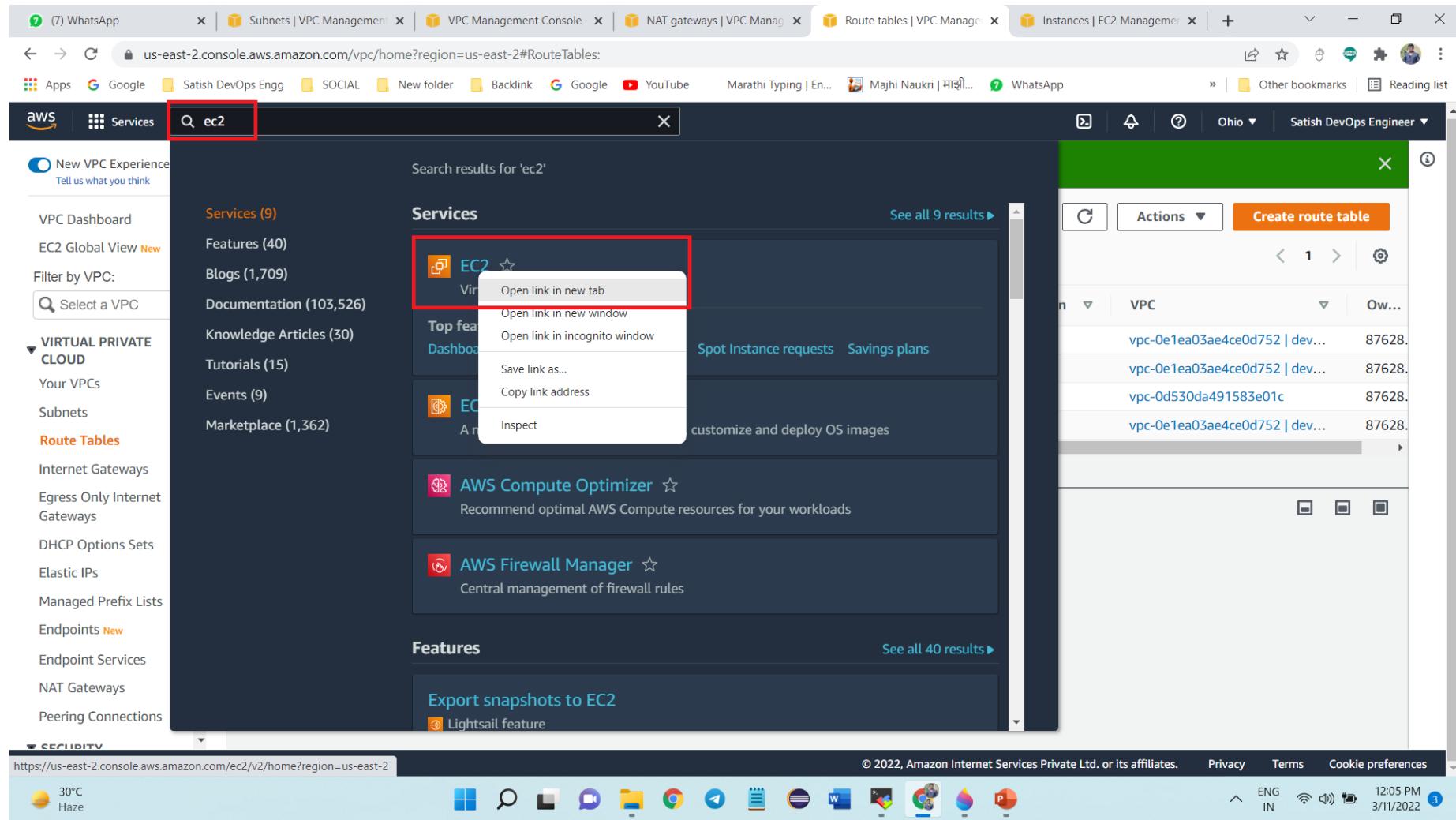
	Name	Route table ID	Explicit subnet associat...	Edge associations	Main	VPC	Ow...
<input type="checkbox"/>	-	rtb-0ce45cd7130c22a95	-	-	Yes	vpc-0e1ea03ae4ce0d752   dev...	87628.
<input type="checkbox"/>	Public-Routing	rtb-06f83db7355a8ad75	subnet-00c1a5d0a1e14...	-	No	vpc-0e1ea03ae4ce0d752   dev...	87628.
<input type="checkbox"/>	-	rtb-0592c01d7b6bc984f	-	-	Yes	vpc-0d530da491583e01c	87628.
<input type="checkbox"/>	Route-Table-For-Na...	rtb-0b138b038eb41ffe4	subnet-0c11c8dc0b1c4f...	-	No	vpc-0e1ea03ae4ce0d752   dev...	87628.

Below the table, a "Select a route table" section is visible with three icons for copy, cut, and paste. The left sidebar under "VIRTUAL PRIVATE CLOUD" includes links for Your VPCs, Subnets, Route Tables (which is selected and highlighted in orange), Internet Gateways, Egress Only Internet Gateways, DHCP Options Sets, Elastic IPs, Managed Prefix Lists, Endpoints (New), Endpoint Services, NAT Gateways, and Peering Connections. The bottom of the screen shows the AWS footer with copyright information, privacy terms, cookie preferences, and a weather widget indicating 30°C Haze.

- Our private subnet is associated with NAT Gateway Successfully.

Now we have to launch EC2 Instances with our created VPC and Subnets

- 1. With Public IP and in Public Subnet**
- 2. Without Public IP and in Public Subnet**
- 3. Without Public IP and in Private Subnet**



- Search EC2 in AWS Search Bar
- Open in New Tab

The screenshot shows the AWS EC2 Instances page. On the left, there's a navigation sidebar with sections like EC2 Dashboard, Events, Tags, Limits, Instances (with 'Instances New' highlighted), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances (New), Dedicated Hosts, Capacity Reservations, Images (AMIs New, AMI Catalog), and Elastic Block Store. The main content area has a search bar and filters for Instance state (pending, running). A large orange box highlights the 'Launch instances' button in the Actions dropdown. Below it, a modal window titled 'Select an instance' is open, also with a red border around its title.

- Go to Instances
- Click on Launch Instances

You've been invited to try an early, beta iteration of the new launch instance wizard. We will continue to improve the experience over the next few months. We're asking customers for their feedback on this early release. To exit the new launch instance wizard at any time, choose the **Cancel** button.

**Try it now!**

1. Choose AMI   2. Choose Instance Type   3. Configure Instance   4. Add Storage   5. Add Tags   6. Configure Security Group   7. Review

**Step 1: Choose an Amazon Machine Image (AMI)**

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

Search for an AMI by entering a search term e.g. "Windows"

Quick Start

- My AMIs
- AWS Marketplace
- Community AMIs
- Free tier only (i)

Amazon Linux 2 AMI (HVM) - Kernel 5.10, SSD Volume Type - ami-008e1e7f1fcbe9b80 (64-bit x86) / ami-0dfb4b2fe71065a95 (64-bit Arm)  
Amazon Linux 2 comes with five years support. It provides Linux kernel 5.10 tuned for optimal performance on Amazon EC2, systemd 219, GCC 7.3, Glibc 2.26, Binutils 2.29.1, and the latest software packages through extras. This AMI is the successor of the Amazon Linux AMI that is now under maintenance only mode and has been removed.  
Root device type: ebs   Virtualization type: hvm   ENA Enabled: Yes  
 64-bit (x86)  64-bit (Arm) **Select**

Amazon Linux 2 AMI (HVM) - Kernel 4.14, SSD Volume Type - ami-07e19c485c7cf2266 (64-bit x86) / ami-0bae01d29ea27ca20 (64-bit Arm)  
Amazon Linux 2 comes with five years support. It provides Linux kernel 4.14 tuned for optimal performance on Amazon EC2, systemd 219, GCC 7.3, Glibc 2.26, Binutils 2.29.1, and the latest software packages through extras. This AMI is the successor of the Amazon Linux AMI that is now under maintenance only mode and has been removed.  
 64-bit (x86)  64-bit (Arm) **Select**

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- Select AMI

The screenshot shows the AWS Launch Instance Wizard at Step 2: Choose an Instance Type. The URL is [us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard](https://us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard). The search bar contains "Search for services, features, blogs, docs, and more". The navigation bar includes tabs for 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Add Tags, 6. Configure Security Group, and 7. Review. The "Choose Instance Type" tab is active.

**Step 2: Choose an Instance Type**

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. [Learn more](#) about instance types and how they can meet your computing needs.

Filter by: All instance families ▾ Current generation ▾ Show/Hide Columns

Currently selected: t2.micro (- ECUs, 1 vCPUs, 2.5 GHz, -, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	t2	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	t2	<b>t2.micro</b> Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	t2	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	t2	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	t2	t2.large	2	8	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	t2	t2.xlarge	4	16	EBS only	-	Moderate	Yes
<input type="checkbox"/>	t2	t2.2xlarge	8	32	EBS only	-	Moderate	Yes

Cancel Previous **Review and Launch** Next: Configure Instance Details

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- Select Instance Type

Screenshot of the AWS Launch Instance Wizard - Step 3: Configure Instance Details.

The screenshot shows the configuration options for launching an instance:

- Number of instances:** 1
- Purchasing option:** Request Spot instances (unchecked)
- Network:** vpc-0e1ea03ae4ce0d752 | devops-VPC
- Subnet:** subnet-00c1a5d0a1e14e5fe | Public-Subnet | us-eas
- Auto-assign Public IP:** Enable
- Hostname type:** Use subnet setting (IP name)
- DNS Hostname:** Enable IP name IPv4 (A record) DNS requests

Buttons at the bottom include: Cancel, Previous, Review and Launch (highlighted in blue), and Next: Add Storage.

At the bottom of the browser window, there is a toolbar with various icons and a status bar showing weather (30°C Haze), language (ENG IN), battery level (12:08 PM 3/11/2022).

- **Select Our VPC**
- **Select Public Subnet**
- **Enable Public IP**
- **Click on Add Storage**

The screenshot shows the AWS Launch Instance Wizard at Step 4: Add Storage. The URL is [us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard](https://us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard). The page displays storage configuration options for an instance.

**Step 4: Add Storage**

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encryption
Root	/dev/xvda	snap-07ba2d261a0335d25	8	General Purpose SSD (gp2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted

**Add New Volume**

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

**Shared file systems**

You currently don't have any file systems on this instance. Select "Add file system" button below to add a file system.

**Add file system**

Buttons: Cancel, Previous, **Review and Launch**, Next: Add Tags

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- Click on Next

Step 5: Add Tags

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.

Key	(128 characters maximum)	Value	(256 characters maximum)	Instances	Volumes	Network Interfaces
Name	A-with-public-IP-in-Public-Subnet	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Add another tag (Up to 50 tags maximum)

Cancel Previous **Review and Launch** Next: Configure Security Group

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- Give Proper tags

The screenshot shows the AWS Launch Instance Wizard at Step 6: Configure Security Group. The security group is named "Only-SSH" and has a single inbound rule for port 22 (SSH) from anywhere. A warning message at the bottom advises against allowing all IP addresses.

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 name:   
Description:

Type	Protocol	Port Range	Source	Description
SSH	TCP	22	Anywhere	0.0.0.0/0, ::/0 e.g. SSH for Admin Desktop

Add Rule

**Warning**  
Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Cancel Previous Review and Launch

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30°C Haze ENG IN 12:10 PM 3/11/2022

- Create security group with SSH 22 as in inbound rule
- Click on Review and Launch

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

**AMI Details**

**Amazon Linux 2 AMI (HVM) - Kernel 5.10, S**  
Free tier eligible

Amazon Linux 2 comes with five years support. It provides the latest security patches and extras. This AMI is the successor of the Amazon Linux 2 AMI.

Root Device Type: ebs Virtualization type: hvm

**Instance Type**

Instance Type	ECUs	vCPUs	Memory (GiB)
t2.micro	-	1	1

**Security Groups**

Groups

Edit AMI

and the latest software packages through

Edit instance type

Work Performance

Moderate

Edit security groups

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ENG IN 12:10 PM 3/11/2022

- Select Key-Pair
- Click on Launch Instances

WhatsApp Subnets | VPC Management VPC Management Console NAT gateways | VPC Management Route tables | VPC Management Launch instance wizard | EC

us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard:

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AWS Services Search for services, features, blogs, docs, and more [Alt+S]

Ohio Satish DevOps Engineer

## Launch Status

Your instances are now launching  
The following instance launches have been initiated: i-04aff5fdfa885eda5 View launch log

Get notified of estimated charges  
Create billing alerts to get an email notification when estimated charges on your AWS bill exceed an amount you define (for example, if you exceed the free usage tier).

- Click on view instances

**Now we will launch one more instance on Public Subnet but disable Public IP**

The screenshot shows the AWS EC2 Instances page. On the left, a sidebar lists navigation options like EC2 Dashboard, Events, Tags, Limits, Instances (with sub-options like Instances, Instance Types, Launch Templates, etc.), Images (AMIs), and Elastic Block Store. The main content area displays a table of instances. A single row is selected, showing an instance named "A-with-public-IP-in-Public-Subnet" with Instance ID "i-04aff5fdfa885eda5", State "Pending", Type "t2.micro", and Status "No status". Above the table are filters: "Instance state = pending" and "Instance state = running". To the right of the table is a "Actions" dropdown menu with a red box highlighting the "Launch instances" button. Below the table, a modal window titled "Select an instance" is open, showing a list of available instances.

- Click on Launch Instances

7 WhatsApp Subnets | VPC Management VPC Management Console NAT gateways | VPC Manag Route tables | VPC Manage Launch instance wizard | EC

us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard:

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aws Services Search for services, features, blogs, docs, and more [Alt+S]

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

## Step 3: Configure Instance Details

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.

Number of instances 1 Launch into Auto Scaling Group

Purchasing option  Request Spot instances

Network vpc-0e1ea03ae4ce0d752 | devops-VPC Create new VPC

Subnet subnet-00c1a5d0a1e14e5fe | Public-Subnet | us-eas Create new subnet  
249 IP Addresses available

Auto-assign Public IP Disable

Hostname type Use subnet setting (IP name)

DNS Hostname  Enable IP name IPv4 (A record) DNS requests

Cancel Previous Review and Launch Next: Add Storage

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- **Select our VPC**
- **Select Public Subnet**
- **Disable Public IP**
- **Click Next**

7 WhatsApp Subnets | VPC Management VPC Management Console NAT gateways | VPC Manag Route tables | VPC Manage Launch instance wizard | EC

us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard:

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AWS Services Search for services, features, blogs, docs, and more [Alt+S]

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 5: Add Tags

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.

Key (128 characters maximum)	Value (256 characters maximum)	Instances <small>i</small>	Volumes <small>i</small>	Network Interfaces <small>i</small>
Name	B-without-public-IP-in-Public-Subnet	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Add another tag (Up to 50 tags maximum)

Cancel Previous Review and Launch Next: Configure Security Group

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- Give Proper Tags

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-0ed36b384fa2a7995	default	default VPC security group	<a href="#">Copy to new</a>
sg-04c0dcfcfbaa81458	Devops-SG	Devops-SG	<a href="#">Copy to new</a>
sg-02b4d699856485139	Only-SSH	Only-SSH	<a href="#">Copy to new</a>

Inbound rules for sg-02b4d699856485139 (Selected security groups: sg-02b4d699856485139)

Type	Protocol	Port Range	Source	Description
SSH	TCP	22	0.0.0.0/0	
SSH	TCP	22	::/0	

Cancel Previous **Review and Launch**

- Select our existing Security Group

The screenshot shows the AWS Launch Instance Wizard at Step 7: Review Instance Launch. The main page displays AMI Details (Amazon Linux 2 AMI (HVM) - Kernel 5.10, Free tier eligible), Instance Type (t2.micro), and Security Groups. A modal window titled "Select an existing key pair or create a new key pair" is overlaid. It contains a note about key pairs, a dropdown for selecting an existing key pair (set to "ohio-instance | RSA"), and a checkbox for acknowledging access to the private key file. At the bottom of the modal are "Cancel" and "Launch Instances" buttons.

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

**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  
ohio-instance | 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

- Select Key-Pair
- Launch Instance

**Now we will launch one more instance on  
Private Subnet and disable Public IP**

The screenshot shows the AWS EC2 Instances page. On the left, there's a navigation sidebar with sections like EC2 Dashboard, Events, Tags, Limits, Instances (with sub-options like Instances, Instance Types, Launch Templates, etc.), Images (AMIs), and Elastic Block Store. The main content area displays a table of instances:

Name	Instance ID	Instance state	Instance type	Status check
A-with-public-IP-in-Public-Subnet	i-04aff5fdfa885eda5	Running	t2.micro	2/2 checks passed
B-without-public-IP-in-Public-Subnet	i-0c1243408f00ac298	Pending	t2.micro	-

At the top right of the main area, there are buttons for Actions, Connect, Instance state, and Launch instances. The 'Launch instances' button is highlighted with a red box. Below the main table, a modal window titled 'Select an instance' is open, showing a single entry: 'A-with-public-IP-in-Public-Subnet'. The bottom of the screen includes a footer with links for Feedback, English (US), Privacy, Terms, and Cookie preferences, along with system status icons for weather (30°C Haze), language (ENG IN), battery (12:13 PM 3/11/2022), and connectivity.

- Click on Launch Instances

Number of instances  Launch into Auto Scaling Group

Purchasing option  Request Spot instances

Network  Create new VPC

Subnet  Create new subnet  
subnet-0c11c8dc0b1c4f38e | Private-Subnet | us-east-2b

Auto-assign Public IP

Hostname type

DNS Hostname  Enable IP name IPv4 (A record) DNS requests  
 Enable resource-based IPv4 (A record) DNS requests  
 Enable resource-based IPv6 (AAAA record) DNS requests

Placement group  Add instance to placement group

Capacity Reservation

Domain join directory

Cancel Previous Review and Launch Next: Add Storage

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- Select our VPC
- Select Our Private Subnet

Number of instances  Launch into Auto Scaling Group

Purchasing option  Request Spot instances

Network  [Create new VPC](#)

Subnet  [Create new subnet](#)  
251 IP Addresses available

Auto-assign Public IP

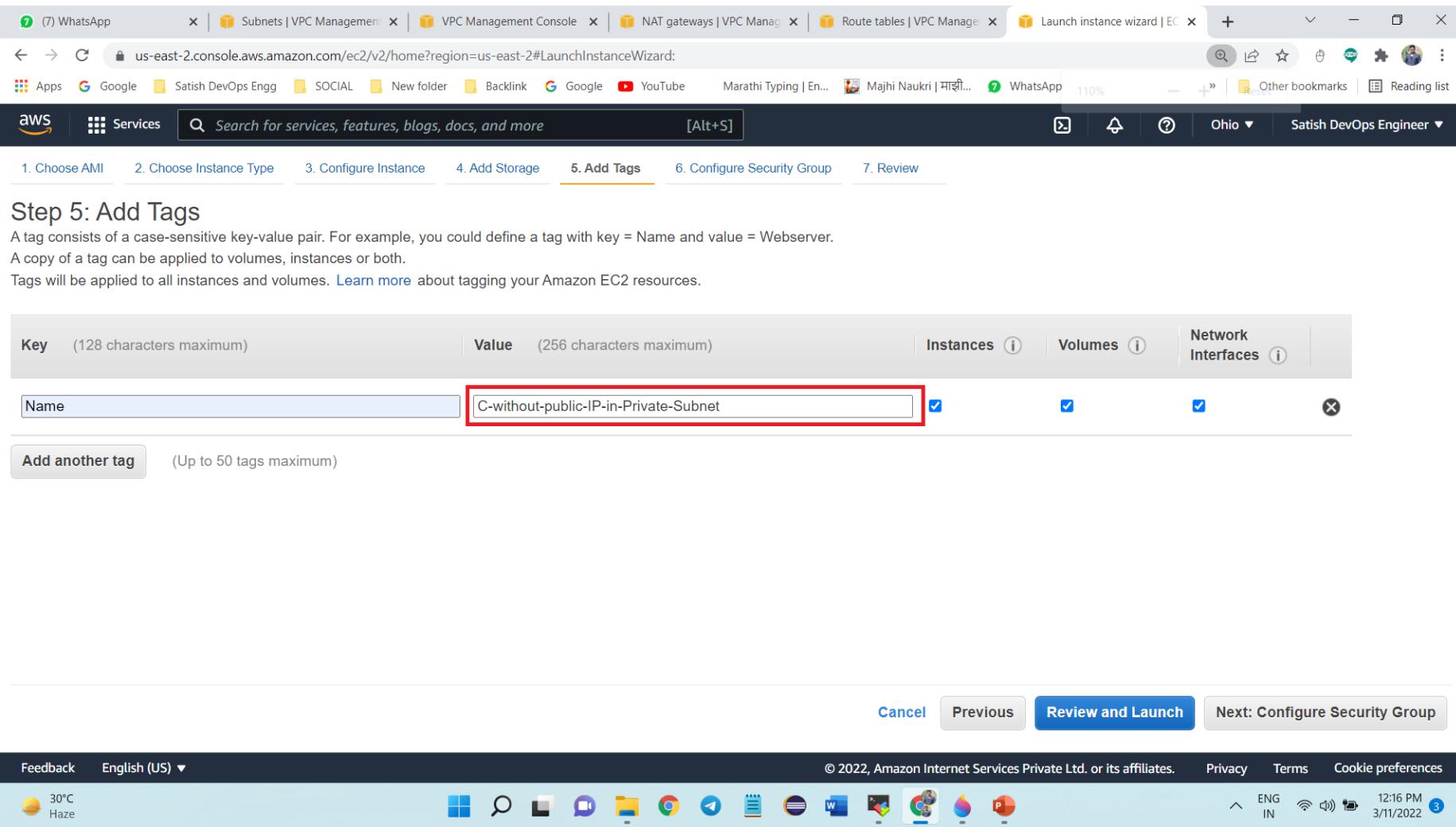
Hostname type

DNS Hostname  Enable IP name IPv4 (A record) DNS requests

Cancel Previous **Review and Launch** Next: Add Storage

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30°C Haze ENG IN 12:15 PM 3/11/2022

- Disable Public IP
- Click next



The screenshot shows the AWS Launch Instance Wizard at Step 5: Add Tags. The URL in the browser is [us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard](https://us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard). The page title is "Search for services, features, blogs, docs, and more". The navigation bar includes links for 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Add Tags (which is active), 6. Configure Security Group, and 7. Review.

**Step 5: Add Tags**

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.

Key (128 characters maximum) | Value (256 characters maximum) | Instances | Volumes | Network Interfaces

Name: C-without-public-IP-in-Private-Subnet

Add another tag (Up to 50 tags maximum)

Cancel Previous Review and Launch Next: Configure Security Group

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30°C Haze ENG IN 12:16 PM 3/11/2022

- Give Proper Tags

The screenshot shows the AWS Launch Instance Wizard at Step 6: Configure Security Group. The browser tab is "us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard". The search bar contains "Search for services, features, blogs, docs, and more". The breadcrumb navigation shows "1. Choose AMI" through "7. Review".

**Assign a security group:**

- Create a new security group
- Select an existing security group

**Security Group ID**

Security Group ID	Name	Description	Actions
sg-0ed36b384fa2a7995	default	default VPC security group	<a href="#">Copy to new</a>
sg-04c0dcfcfbba81458	Devops-SG	Devops-SG	<a href="#">Copy to new</a>
sg-02b4d699856485139	Only-SSH	Only-SSH	<a href="#">Copy to new</a>

**Inbound rules for sg-02b4d699856485139 (Selected security groups: sg-02b4d699856485139)**

Type	Protocol	Port Range	Source	Description
SSH	TCP	22	0.0.0.0/0	
SSH	TCP	22	::/0	

Buttons: Cancel, Previous, **Review and Launch**

Page footer: Feedback, English (US), © 2022, Amazon Internet Services Private Ltd. or its affiliates., Privacy, Terms, Cookie preferences, Weather (30°C Haze), ENG IN, 12:16 PM, 3/1/2022, 3 notifications.

- Select Existing Security Group

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to previous steps or proceed to the next step.

**AMI Details**

**Amazon Linux 2 AMI (HVM) - Kernel 5.10**

Free tier eligible

Amazon Linux 2 comes with five years support and includes over 1,000 software packages through extras. This AMI is based on the Amazon Linux 2 kernel and includes the latest version of the Amazon Linux 2 kernel.

Root Device Type: ebs Virtualization type: hvm

**Instance Type**

Instance Type	ECUs	vCPUs
t2.micro	-	1

**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

ohio-instance | 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

Network Performance

Low to Moderate

Cancel Previous Launch

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- Select Key-Pair
- Launch Instance

- Here we have created all three instances as per requirement.
- Now connect to instance which has Public IP and present in Public Subnet

The screenshot shows the AWS EC2 Instances page. On the left, there's a navigation sidebar with various options like EC2 Dashboard, EC2 Global View, Events, Tags, Limits, Instances (selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, and Capacity Reservations. Below that is an 'Images' section with AMIs. The main content area has a search bar and filters for Instance state (pending, running). A red box highlights the 'Connect' button in the top toolbar. The table lists three instances:

Name	Instance ID	Instance state	Instance type	Status
A-with-public-IP-in-Public-Subnet	i-04aff5fd885eda5	Running	t2.micro	2/2 ch
B-without-public-IP-in-Public-Subnet	i-0c1243408f00ac298	Running	t2.micro	2/2 ch
C-without-public-IP-in-Private-Subnet	i-0ef4f2e5961dc8a1c	Running	t2.micro	-

Below the table, a specific instance is selected: **Instance: i-04aff5fd885eda5 (A-with-public-IP-in-Public-Subnet)**. The 'Details' tab is active, showing the following details:

Instance ID	Public IPv4 address	Private IPv4 addresses
i-04aff5fd885eda5 (A-with-public-IP-in-Public-Subnet)	18.221.216.67   <a href="#">open address</a>	10.10.1.36
IPv6 address	Instance state	Public IPv4 DNS
-	Running	-

At the bottom, there are links for Feedback, English (US), Privacy, Terms, and Cookie preferences, along with system status icons.

- Select the instance
- Click on Connect

The screenshot shows the AWS EC2 'Connect to instance' page for an instance with ID i-04aff5fd8a885eda5. The 'SSH client' tab is selected. The page provides instructions for connecting via SSH:

- Open an SSH client.
- Locate your private key file. The key used to launch this instance is ohio-instance.pem
- Run this command, if necessary, to ensure your key is not publicly viewable.  
chmod 400 ohio-instance.pem
- Connect to your instance using its Public IP:  
18.221.216.67

An example command is shown in a red box:

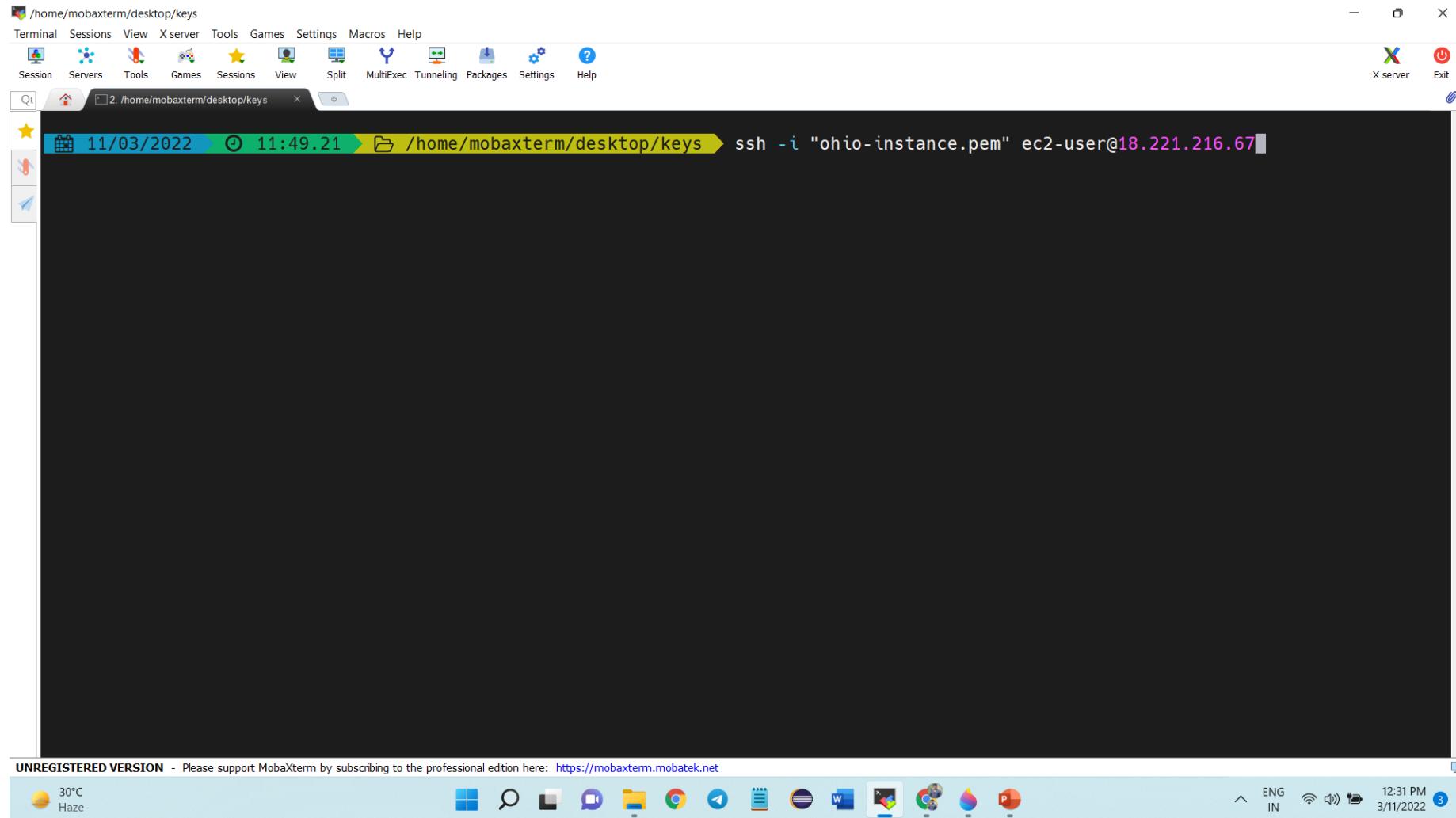
```
ssh -i "ohio-instance.pem" ec2-user@18.221.216.67
```

A note below the command states: "Note: In most cases, the guessed user name is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI user name."

The browser's address bar shows the URL: us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#ConnectToInstance:instanceId=i-04aff5fd8a885eda5

The bottom of the screen includes standard browser controls like back, forward, search, and a toolbar with various icons.

- Copy the Last Command



- Open MobaxTerm
- Paste Command and Press Enter

The screenshot shows a MobaXterm window titled "ec2-user@ip-10-10-1-36:~". The terminal session displays the following output:

```
11/03/2022 11:49:21 /home/mobaxterm/desktop/keys ssh -i "ohio-instance.pem" ec2-user@18.221.216.67
Warning: Permanently added '18.221.216.67' (RSA) to the list of known hosts.
X11 forwarding request failed on channel 0
Amazon Linux 2 AMI
https://aws.amazon.com/amazon-linux-2/
No packages needed for security; 5 packages available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-10-10-1-36 ~]$
```

The status bar at the bottom of the terminal window indicates an unregistered version, a weather icon for 30°C Haze, and system information including ENG IN, battery level, and the date/time (12:32 PM, 3/11/2022).

- Here we have connected to our instance.

```
ec2-user@ip-10-10-1-36:~$ ssh -i "ohio-instance.pem" ec2-user@18.221.216.67
Warning: Permanently added '18.221.216.67' (RSA) to the list of known hosts.
X11 forwarding request failed on channel 0

[ec2-user@ip-10-10-1-36 ~]$ 
[ec2-user@ip-10-10-1-36 ~]$ ping google.com
PING google.com (142.250.191.174) 56(84) bytes of data.
64 bytes from ord38s30-in-f14.1e100.net (142.250.191.174): icmp_seq=1 ttl=93 time=18.2 ms
64 bytes from ord38s30-in-f14.1e100.net (142.250.191.174): icmp_seq=2 ttl=93 time=18.3 ms
64 bytes from ord38s30-in-f14.1e100.net (142.250.191.174): icmp_seq=3 ttl=93 time=18.2 ms

--- google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 18.238/18.270/18.314/0.114 ms
[ec2-user@ip-10-10-1-36 ~]$ 
```

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ENG IN 12:32 PM 3/11/2022

- Use **ping google.com**
- We can able to use ping command because this instance has Public IP and present in Public Subnet.

- Now we will go inside of our second Instance
- Which is present in Public Subnet but Disabled Public IP

```
[ec2-user@ip-10-10-1-36 ~]$ sudo su -
[root@ip-10-10-1-36 ~]#
[root@ip-10-10-1-36 ~]#
[root@ip-10-10-1-36 ~]# cd /
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]# ls -ltr
total 16
drwxr-xr-x  2 root root   6 Apr  9  2019 srv
drwxr-xr-x  2 root root   6 Apr  9  2019 mnt
drwxr-xr-x  2 root root   6 Apr  9  2019 media
drwxr-xr-x  2 root root   6 Mar  7 00:13 local
lrwxrwxrwx  1 root root   8 Mar  7 00:13 sbin -> usr/sbin
lrwxrwxrwx  1 root root   9 Mar  7 00:13 lib64 -> usr/lib64
lrwxrwxrwx  1 root root   7 Mar  7 00:13 lib -> usr/lib
lrwxrwxrwx  1 root root   7 Mar  7 00:13 bin -> usr/bin
drwxr-xr-x 13 root root  155 Mar  7 00:13 usr
drwxr-xr-x  4 root root  27 Mar  7 00:14 opt
dr-xr-xr-x 13 root root   0 Mar 11 06:40 sys
dr-xr-xr-x 159 root root   0 Mar 11 06:40 proc
drwxr-xr-x 19 root root  269 Mar 11 06:41 var
drwxr-xr-x 15 root root 2900 Mar 11 06:41 dev
drwxr-xr-x  3 root root  22 Mar 11 06:41 home
dr-xr-x--  3 root root 103 Mar 11 06:41 root
drwxr-xr-x  80 root root 8192 Mar 11 06:41 etc
dr-xr-xr-x  4 root root 4096 Mar 11 06:41 boot
drwxr-xr-x  28 root root  960 Mar 11 06:41 run
drwxrwxrwt  8 root root 172 Mar 11 06:41 tmp
[root@ip-10-10-1-36 /]#
```

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- Use **sudo su -**
- Use **cd /**
- Use **ls -litr**

The screenshot shows a MobaXterm terminal window with the following session details:

- Session: 2
- Host: root@ip-10-10-1-36/

The terminal window displays the following command history and output:

```
[root@ip-10-10-1-36 ~]# cd /
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]# ls -ltr
total 16
drwxr-xr-x  2 root root   6 Apr  9  2019 srv
drwxr-xr-x  2 root root   6 Apr  9  2019 mnt
drwxr-xr-x  2 root root   6 Apr  9  2019 media
drwxr-xr-x  2 root root  6 Mar  7 00:13 local
lrwxrwxrwx  1 root root   8 Mar  7 00:13 sbin -> usr/sbin
lrwxrwxrwx  1 root root   9 Mar  7 00:13 lib64 -> usr/lib64
lrwxrwxrwx  1 root root   7 Mar  7 00:13 lib -> usr/lib
lrwxrwxrwx  1 root root   7 Mar  7 00:13 bin -> usr/bin
drwxr-xr-x  13 root root  155 Mar  7 00:13 usr
drwxr-xr-x  4 root root  27 Mar  7 00:14 opt
dr-xr-xr-x  13 root root   0 Mar 11 06:40 sys
dr-xr-xr-x  159 root root   0 Mar 11 06:40 proc
drwxr-xr-x  19 root root  269 Mar 11 06:41 var
drwxr-xr-x  15 root root 2900 Mar 11 06:41 dev
drwxr-xr-x  3 root root  22 Mar 11 06:41 home
dr-xr-x---  3 root root 103 Mar 11 06:41 root
drwxr-xr-x  80 root root 8192 Mar 11 06:41 etc
dr-xr-xr-x  4 root root 4096 Mar 11 06:41 boot
drwxr-xr-x  28 root root  960 Mar 11 06:41 run
drwxrwxrwt  8 root root  172 Mar 11 06:41 tmp
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]# vi ohio-instance.pem
```

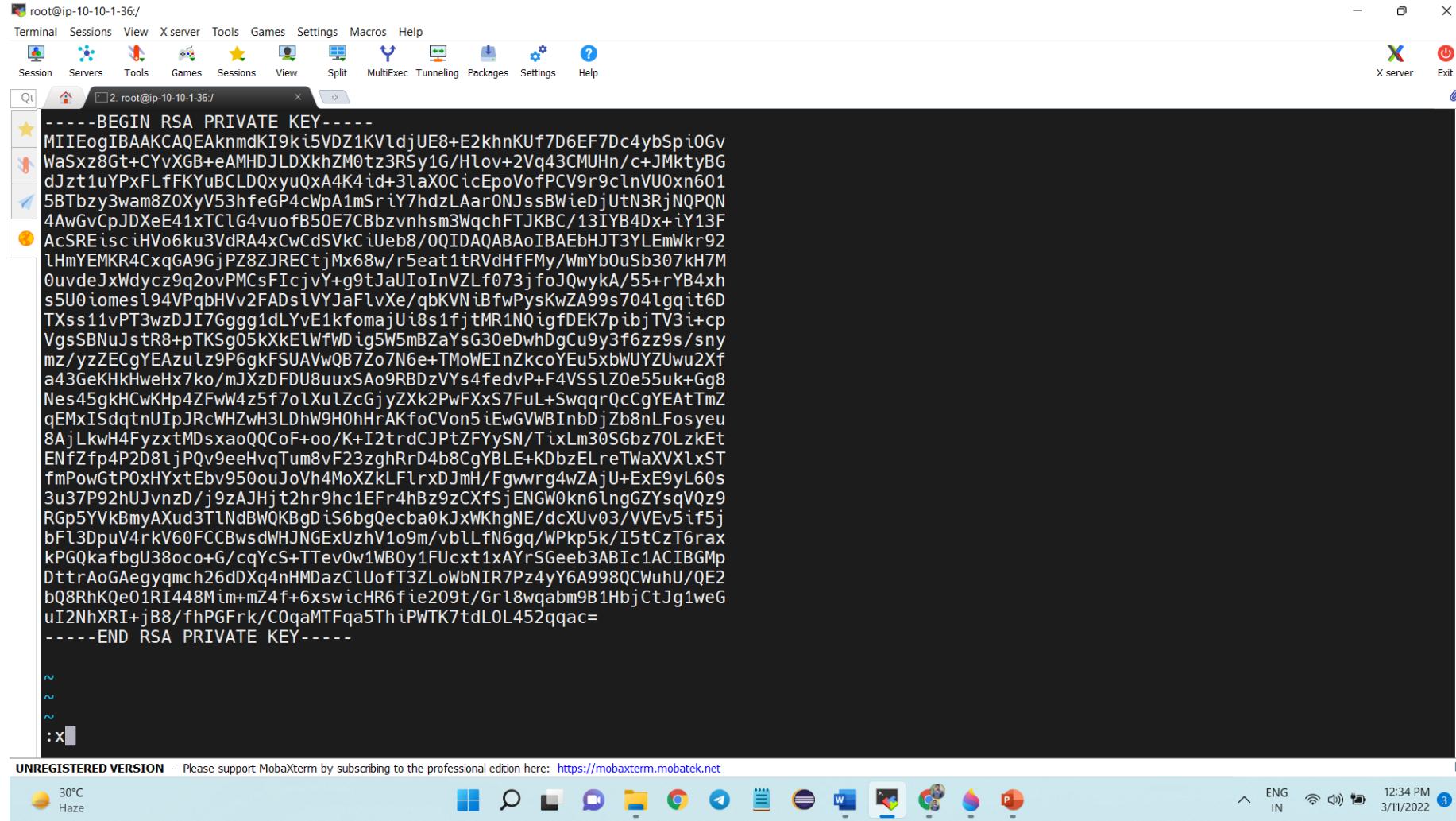
The command `vi ohio-instance.pem` is highlighted with a red box.

At the bottom of the terminal window, there is a watermark: "UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>".

The system tray at the bottom right shows the following information:

- Temperature: 30°C Haze
- Language: ENG IN
- Network: Wi-Fi signal
- Date and Time: 12:34 PM 3/11/2022

- Use `vi ohio-instance.pem`



The screenshot shows a terminal window titled 'root@ip-10-10-1-36/'. The window contains a large block of RSA PRIVATE KEY data, starting with '-----BEGIN RSA PRIVATE KEY-----' and ending with '-----END RSA PRIVATE KEY-----'. Below the key data, there are three question marks (~) and a command ':x' at the bottom. At the very bottom of the terminal window, a blue bar displays the message 'UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>'. The system tray at the bottom right shows the date and time as '3/11/2022 12:34 PM'.

```
MIIEogIBAAKCAQEAk...n601
-----BEGIN RSA PRIVATE KEY-----
MIIEogIBAAKCAQEAk...n601
-----END RSA PRIVATE KEY-----
~  
~  
~  
:x
```

- Paste your data which is in Key Pair

The screenshot shows a terminal window in MobaXterm with the following content:

```
total 16
drwxr-xr-x  2 root root   6 Apr  9  2019 srv
drwxr-xr-x  2 root root   6 Apr  9  2019 mnt
drwxr-xr-x  2 root root   6 Apr  9  2019 media
drwxr-xr-x  2 root root  6 Mar  7 00:13 local
lrwxrwxrwx  1 root root   8 Mar  7 00:13 sbin -> usr/sbin
lrwxrwxrwx  1 root root   9 Mar  7 00:13 lib64 -> usr/lib64
lrwxrwxrwx  1 root root   7 Mar  7 00:13 lib -> usr/lib
lrwxrwxrwx  1 root root   7 Mar  7 00:13 bin -> usr/bin
drwxr-xr-x 13 root root  155 Mar  7 00:13 usr
drwxr-xr-x  4 root root  27 Mar  7 00:14 opt
dr-xr-xr-x 13 root root   0 Mar 11 06:40 sys
dr-xr-xr-x 159 root root   0 Mar 11 06:40 proc
drwxr-xr-x 19 root root  269 Mar 11 06:41 var
drwxr-xr-x 15 root root 2900 Mar 11 06:41 dev
drwxr-xr-x  3 root root  22 Mar 11 06:41 home
dr-xr-x--  3 root root 103 Mar 11 06:41 root
drwxr-xr-x  80 root root 8192 Mar 11 06:41 etc
dr-xr-xr-x  4 root root 4096 Mar 11 06:41 boot
drwxr-xr-x  28 root root  960 Mar 11 06:41 run
drwxrwxrwt  8 root root  172 Mar 11 06:41 tmp
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]# vi ohio-instance.pem
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]# chmod 400 ohio-instance.pem
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
```

The command `chmod 400 ohio-instance.pem` is highlighted with a red box.

At the bottom of the terminal window, there is a message: **UNREGISTERED VERSION** - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>

The taskbar at the bottom of the screen includes icons for weather (30°C Haze), search, file explorer, browser, messaging, calendar, task manager, and other system utilities. The system tray shows the date and time (12:35 PM, 3/11/2022).

- Use **chmod 400 ohio-instance.pem**

The screenshot shows the AWS EC2 Instances page. On the left, there's a sidebar with various navigation options like EC2 Dashboard, Events, Tags, Limits, and Instances. Under Instances, there are sub-options for Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, and Capacity Reservations. Below that is a section for Images with AMIs. At the bottom of the sidebar, there are links for Feedback, English (US), and a weather widget showing 30°C Haze. The main content area has a search bar at the top. Below it, there's a table titled 'Instances (1/3)'. The table has columns for Name, Instance ID, Instance state, Instance type, and Status. Three instances are listed: 'A-with-public-IP-in-Public-Subnet' (pending), 'B-without-public-IP-in-Public-Subnet' (running, selected and highlighted with a red box), and 'C-without-public-IP-in-Private-Subnet' (running). A 'Connect' button is located above the table, also highlighted with a red box. Below the table, a specific instance is detailed: Instance i-0c1243408f00ac298 (B-without-public-IP-in-Public-Subnet). The details shown include Instance ID, Public IPv4 address (empty), Private IPv4 addresses (10.10.1.241), IPv6 address (empty), Instance state (Running), and Public IPv4 DNS (empty). The bottom of the page includes standard footer links for Privacy, Terms, and Cookie preferences, along with system status icons and a date/time stamp (12:35 PM 3/11/2022).

Name	Instance ID	Instance state	Instance type	Status
A-with-public-IP-in-Public-Subnet	i-04aff5fd885eda5	Running	t2.micro	2/2 ch
<b>B-without-public-IP-in-Public-Subnet</b>	<b>i-0c1243408f00ac298</b>	<b>Running</b>	<b>t2.micro</b>	<b>2/2 ch</b>
C-without-public-IP-in-Private-Subnet	i-0ef4f2e5961dc8a1c	Running	t2.micro	2/2 ch

- Select your 2<sup>nd</sup> instance
- Click on connect

Connect to instance [Info](#)

Connect to your instance i-0c1243408f00ac298 (B-without-public-IP-in-Public-Subnet) using any of these options

EC2 Instance Connect | Session Manager | **SSH client** | EC2 Serial Console

Instance ID  
i-0c1243408f00ac298 (B-without-public-IP-in-Public-Subnet)

1. Open an SSH client.
2. Locate your private key file. The key used to launch this instance is ohio-instance.pem
3. Run this command, if necessary, to ensure your key is not publicly viewable.  
chmod 400 ohio-instance.pem
4. Connect to your instance using its Private IP:  
10.10.1.241

Example:

```
ssh -i "ohio-instance.pem" ec2-user@10.10.1.241
```

**Note:** In most cases, the guessed user name is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI user name.

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30°C Haze ENG IN 12:36 PM 3/11/2022

- Copy last command

root@ip-10-10-1-36:/

Terminal Sessions View Xserver Tools Games Settings Macros Help

Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help

X server Exit

2 root@ip-10-10-1-36/

```
total 16
drwxr-xr-x  2 root root   6 Apr  9  2019 srv
drwxr-xr-x  2 root root   6 Apr  9  2019 mnt
drwxr-xr-x  2 root root   6 Apr  9  2019 media
drwxr-xr-x  2 root root  6 Mar  7 00:13 local
lrwxrwxrwx  1 root root   8 Mar  7 00:13 sbin -> usr/sbin
lrwxrwxrwx  1 root root   9 Mar  7 00:13 lib64 -> usr/lib64
lrwxrwxrwx  1 root root   7 Mar  7 00:13 lib -> usr/lib
lrwxrwxrwx  1 root root   7 Mar  7 00:13 bin -> usr/bin
drwxr-xr-x 13 root root  155 Mar  7 00:13 usr
drwxr-xr-x  4 root root  27 Mar  7 00:14 opt
dr-xr-xr-x 13 root root   0 Mar 11 06:40 sys
dr-xr-xr-x 159 root root   0 Mar 11 06:40 proc
drwxr-xr-x 19 root root  269 Mar 11 06:41 var
drwxr-xr-x 15 root root 2900 Mar 11 06:41 dev
drwxr-xr-x  3 root root  22 Mar 11 06:41 home
dr-xr-x--  3 root root 103 Mar 11 06:41 root
drwxr-xr-x 80 root root 8192 Mar 11 06:41 etc
dr-xr-xr-x  4 root root 4096 Mar 11 06:41 boot
drwxr-xr-x 28 root root  960 Mar 11 06:41 run
drwxrwxrwt  8 root root  172 Mar 11 06:41 tmp
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]# vi ohio-instance.pem
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]# chmod 400 ohio-instance.pem
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]# ssh -i "ohio-instance.pem" ec2-user@10.10.1.241
```

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30°C Haze

ENG IN 12:36 PM 3/11/2022

- Paste in MobaXTerm
- Press Enter

```
ec2-user@ip-10-10-1-241:~$ ls
dr-xr-xr-x 159 root root 0 Mar 11 06:40 proc
drwxr-xr-x 19 root root 269 Mar 11 06:41 var
drwxr-xr-x 15 root root 2900 Mar 11 06:41 dev
drwxr-xr-x 3 root root 22 Mar 11 06:41 home
dr-xr-x--- 3 root root 103 Mar 11 06:41 root
drwxr-xr-x 80 root root 8192 Mar 11 06:41 etc
dr-xr-xr-x 4 root root 4096 Mar 11 06:41 boot
drwxr-xr-x 28 root root 960 Mar 11 06:41 run
drwxrwxrwt 8 root root 172 Mar 11 06:41 tmp
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]# vi ohio-instance.pem
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]# chmod 400 ohio-instance.pem
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]#
[root@ip-10-10-1-36 /]# ssh -i "ohio-instance.pem" ec2-user@10.10.1.241
The authenticity of host '10.10.1.241 (10.10.1.241)' can't be established.
ECDSA key fingerprint is SHA256:LE+kelD2QaVvP/HPI7YDRsWjsCvKXS8kR0wbEeIu2k.
ECDSA key fingerprint is MD5:13:5a:ec:57:f2:93:62:a8:98:69:19:ad:39:21:c5:cc.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.10.1.241' (ECDSA) to the list of known hosts.

|_ _|_) / Amazon Linux 2 AMI
__| \_|_|_
https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-10-10-1-241 ~]$
```

UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>

32°C Haze ENG IN 12:36 PM 3/11/2022

- Enter yes
- Press Enter
- Now we are connected to 2nd instance

```
[root@ip-10-10-1-36 ~]# vi ohio-instance.pem
[root@ip-10-10-1-36 ~]#
[root@ip-10-10-1-36 ~]# chmod 400 ohio-instance.pem
[root@ip-10-10-1-36 ~]#
[root@ip-10-10-1-36 ~]#
[root@ip-10-10-1-36 ~]# ssh -i "ohio-instance.pem" ec2-user@10.10.1.241
The authenticity of host '10.10.1.241 (10.10.1.241)' can't be established.
ECDSA key fingerprint is SHA256:LE+keID2QaVvP/HPI7YDRsWjsoCvKXS8kR0wbEeIu2k.
ECDSA key fingerprint is MD5:13:5a:ec:57:f2:93:62:a8:98:69:19:ad:39:21:c5:cc.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.10.1.241' (ECDSA) to the list of known hosts.

 _|_(_|-_) Amazon Linux 2 AMI
__|_\_|_|

https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-10-10-1-241 ~]$ 
[ec2-user@ip-10-10-1-241 ~]$ 
[ec2-user@ip-10-10-1-241 ~]$ ping google.com
PING google.com (142.250.191.206) 56(84) bytes of data.

--- google.com ping statistics ---
10 packets transmitted, 0 received, 100% packet loss, time 9198ms

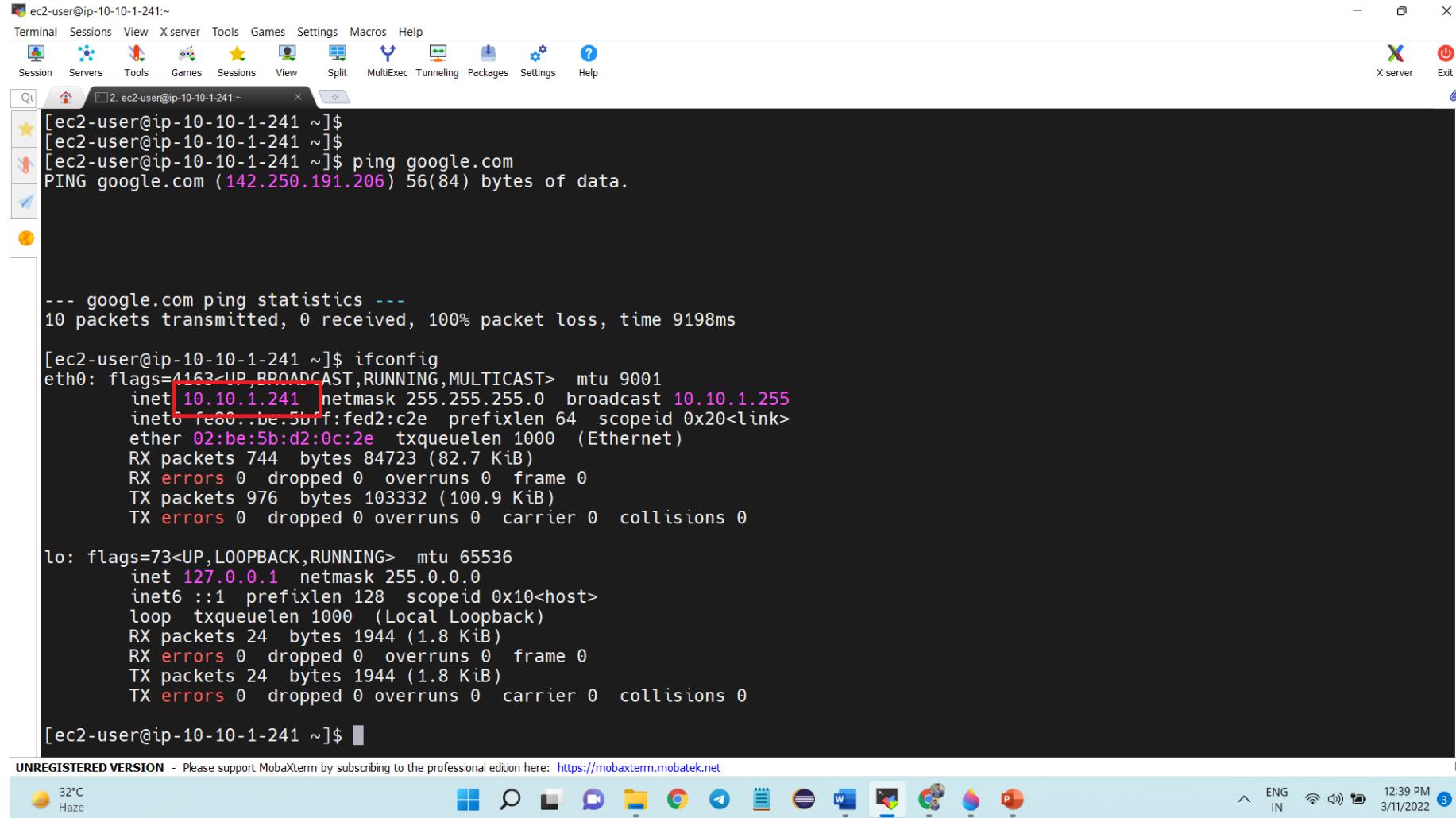
[ec2-user@ip-10-10-1-241 ~]$
```

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32°C Haze

ENG IN 12:37 PM 3/11/2022

- Use **ping google.com**
- Here our ping command is not working properly
- Because it doesn't have Public IP and also it doesn't present in Public Subnet.



The screenshot shows a terminal window in MobaXterm with the title bar "ec2-user@ip-10-10-1-241:~". The menu bar includes Terminal, Sessions, View, Xserver, Tools, Games, Settings, Macros, Help, and a toolbar with Session, Servers, Tools, Games, Sessions, View, Split, MultiExec, Tunneling, Packages, Settings, and Help. The main terminal area displays the following command-line session:

```
[ec2-user@ip-10-10-1-241 ~]$  
[ec2-user@ip-10-10-1-241 ~]$ ping google.com  
PING google.com (142.250.191.206) 56(84) bytes of data.  
  
--- google.com ping statistics ---  
10 packets transmitted, 0 received, 100% packet loss, time 9198ms  
  
[ec2-user@ip-10-10-1-241 ~]$ ifconfig  
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 9001  
    inet 10.10.1.241 netmask 255.255.255.0 broadcast 10.10.1.255  
        inetb fe80::be5bf:fed2:c2e prefixlen 64 scopeid 0x20<link>  
    ether 02:be:5b:d2:0c:2e txqueuelen 1000 (Ethernet)  
        RX packets 744 bytes 84723 (82.7 KiB)  
        RX errors 0 dropped 0 overruns 0 frame 0  
        TX packets 976 bytes 103332 (100.9 KiB)  
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536  
    inet 127.0.0.1 netmask 255.0.0.0  
        inet6 ::1 prefixlen 128 scopeid 0x10<host>  
    loop txqueuelen 1000 (Local Loopback)  
        RX packets 24 bytes 1944 (1.8 KiB)  
        RX errors 0 dropped 0 overruns 0 frame 0  
        TX packets 24 bytes 1944 (1.8 KiB)  
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
[ec2-user@ip-10-10-1-241 ~]$
```

The IP address 10.10.1.241 is highlighted with a red box. The status bar at the bottom indicates "UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>". The system tray shows the date and time as 3/11/2022 12:39 PM, and icons for battery, signal, and network.

- We can cross check our Private IP as well

- Now we will go inside of our third Instance
- Which is present in Private Subnet but Disabled Public IP

A screenshot of a MobaXterm terminal window titled "root@ip-10-10-1-241/". The window shows a root shell with various system statistics and configuration details. The terminal has a dark background with white text. A red box highlights the command "sudo su -" and another red box highlights the command "cd /".

```
root@ip-10-10-1-241:/ 
ether 02:be:5b:d2:0c:2e txqueuelen 1000 (Ethernet)
RX packets 744 bytes 84723 (82.7 KiB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 976 bytes 103332 (100.9 KiB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
inet6 ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 24 bytes 1944 (1.8 KiB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 24 bytes 1944 (1.8 KiB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

[ec2-user@ip-10-10-1-241 ~]$ 
[ec2-user@ip-10-10-1-241 ~]$ 
[ec2-user@ip-10-10-1-241 ~]$ 
[ec2-user@ip-10-10-1-241 ~]$ 
[ec2-user@ip-10-10-1-241 ~]$ 
[ec2-user@ip-10-10-1-241 ~]$ 
[ec2-user@ip-10-10-1-241 ~]$ sudo su -
[root@ip-10-10-1-241 ~]#
[root@ip-10-10-1-241 ~]#
[root@ip-10-10-1-241 ~]#
[root@ip-10-10-1-241 ~]#
[root@ip-10-10-1-241 ~]#
[root@ip-10-10-1-241 ~]# cd /
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]# 
```

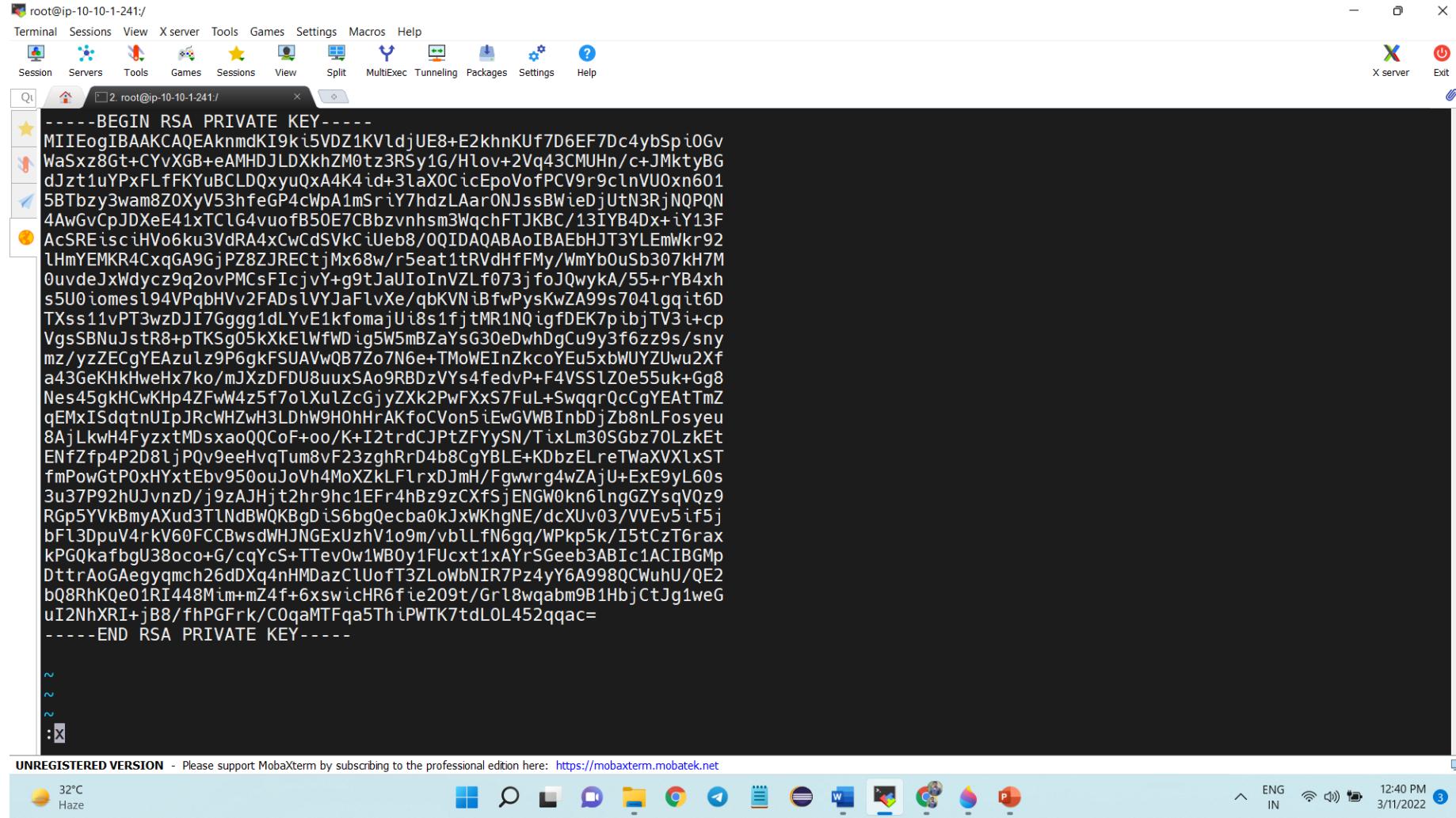
UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>

32°C Haze ENG IN 12:39 PM 3/11/2022

- Use **sudo su -**
- Use **cd /**

[root@ip-10-10-1-241 ~]#  
[root@ip-10-10-1-241 ~]#  
[root@ip-10-10-1-241 ~]#  
[root@ip-10-10-1-241 ~]# cd /  
[root@ip-10-10-1-241 /]#  
[root@ip-10-10-1-241 /]#  
[root@ip-10-10-1-241 /]#  
[root@ip-10-10-1-241 /]# ls -ltr  
total 16  
drwxr-xr-x 2 root root 6 Apr 9 2019 srv  
drwxr-xr-x 2 root root 6 Apr 9 2019 mnt  
drwxr-xr-x 2 root root 6 Apr 9 2019 media  
drwxr-xr-x 2 root root 6 Mar 7 00:13 local  
lrwxrwxrwx 1 root root 8 Mar 7 00:13 sbin -> usr/sbin  
lrwxrwxrwx 1 root root 9 Mar 7 00:13 lib64 -> usr/lib64  
lrwxrwxrwx 1 root root 7 Mar 7 00:13 lib -> usr/lib  
lrwxrwxrwx 1 root root 7 Mar 7 00:13 bin -> usr/bin  
drwxr-xr-x 13 root root 155 Mar 7 00:13 usr  
drwxr-xr-x 4 root root 27 Mar 7 00:14 opt  
dr-xr-xr-x 4 root root 4096 Mar 7 00:15 boot  
dr-xr-xr-x 13 root root 0 Mar 11 06:44 sys  
dr-xr-xr-x 156 root root 0 Mar 11 06:44 proc  
drwxr-xr-x 19 root root 269 Mar 11 06:44 var  
drwxr-xr-x 15 root root 2900 Mar 11 06:44 dev  
drwxr-xr-x 3 root root 22 Mar 11 06:44 home  
dr-xr-x--- 3 root root 103 Mar 11 06:44 root  
drwxr-xr-x 80 root root 8192 Mar 11 06:44 etc  
drwxr-xr-x 28 root root 980 Mar 11 06:44 run  
drwxrwxrwt 8 root root 172 Mar 11 06:44 tmp  
[root@ip-10-10-1-241 /]#  
[root@ip-10-10-1-241 /]#  
[root@ip-10-10-1-241 /]# vi ohio-instance.pem

- Use `vi ohio-instance.pem`



The screenshot shows a MobaXterm terminal window titled "root@ip-10-10-1-241:/". The window contains a large block of RSA PRIVATE KEY data, starting with "-----BEGIN RSA PRIVATE KEY-----" and ending with "-----END RSA PRIVATE KEY-----". Below the terminal window, the system tray displays the date and time as "3/11/2022 12:40 PM", the location as "ENG IN", and the weather as "32°C Haze".

```
MIIEogIBAAKCAQEAk...n601
5BTbzy3wam8Z0XyV53hfeGP4cWpA1mSrY7hdzL...NQPQN
4AwGvCpJD.../13IYB4Dx+iY13F
AcSREisciH...92
lHmYEMKR4CxqGA9gjPZ8ZJRECtjMx68w/r5eat1tRVdHfFMy/WmYbOuSb307kH7M
0uvdeJxWdy...5+rYB4xh
s5U0iomesl94VPqbHVv2FADsLVYJaFlvXe/qbKVNiBfwPysKwZA99s704lgqit6D
TXss11vPT3wzDJ17Gggg1dLYvE1kfomajUi8s1fjtMR1NQigfDEK7pibjTV3i+cp
VgsSBNuJstR8+pTKSg05kXkElWfWDig5W5mBzaYsG30eDwhDgCu9y3f6zz9s/sny
mz/yzZEcgYEazulz9P6gkFSUA...2Xf
a43GeKHkHweHx7ko/mJxZDFDU8uu...55uk+Gg8
Nes45gkHCwKH...qEMxISdqtnUIpJRC...8AjLkwH4FyzxtMDs...8A
ENfZfp4P2D81jPQv9eeHvqTum8Vf23zghRrD4b8CgYBLE+KDbzELreTWaXVXlxST
fmPowGtP0xHYxtEb...3u37P92hUJvnzD/j9zAJHjt2hr9hc1EFr4hBz9zCXfSjENGW0kn6ln...GZYsqVQz9
RGp5YVkBmyAxud3TlNdBWQKBgDiS6bgQecba0kJxWKh...dcXUv03/VVEv5if5j
bFL3DpuV4rkV60FCCBwsdWHJNGExUzhV1o9m/vbLLfN6gq/WPk...5k/I5tCzT6rax
kPGQka...DtrAoG...DtrAoG...DtrAoG...
ui2NhXRI+jB8/fhPGFrk/C0qaMTFqa5ThiPWT...52qqac=
```

- Paste your key-pair details and save file

The screenshot shows a terminal window in MobaXterm with the following content:

```
root@ip-10-10-1-241:/ 
total 16
drwxr-xr-x  2 root root   6 Apr  9  2019 srv
drwxr-xr-x  2 root root   6 Apr  9  2019 mnt
drwxr-xr-x  2 root root   6 Apr  9  2019 media
drwxr-xr-x  2 root root  6 Mar  7 00:13 local
lrwxrwxrwx  1 root root   8 Mar  7 00:13 sbin -> usr/sbin
lrwxrwxrwx  1 root root   9 Mar  7 00:13 lib64 -> usr/lib64
lrwxrwxrwx  1 root root   7 Mar  7 00:13 lib -> usr/lib
lrwxrwxrwx  1 root root   7 Mar  7 00:13 bin -> usr/bin
drwxr-xr-x 13 root root  155 Mar  7 00:13 usr
drwxr-xr-x  4 root root  27 Mar  7 00:14 opt
dr-xr-xr-x  4 root root 4096 Mar  7 00:15 boot
dr-xr-xr-x 13 root root   0 Mar 11 06:44 sys
dr-xr-xr-x 156 root root   0 Mar 11 06:44 proc
drwxr-xr-x 19 root root  269 Mar 11 06:44 var
drwxr-xr-x 15 root root 2900 Mar 11 06:44 dev
drwxr-xr-x  3 root root  22 Mar 11 06:44 home
dr-xr-x--  3 root root 103 Mar 11 06:44 root
drwxr-xr-x  80 root root 8192 Mar 11 06:44 etc
drwxr-xr-x  28 root root  980 Mar 11 06:44 run
drwxrwxrwt  8 root root  172 Mar 11 06:44 tmp
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]# vi ohio-instance.pem
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]# chmod 400 ohio-instance.pem
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]#
```

The command `chmod 400 ohio-instance.pem` is highlighted with a red box.

At the bottom of the terminal window, there is a watermark: **UNREGISTERED VERSION** - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>

The taskbar at the bottom of the screen includes icons for weather (32°C Haze), search, file explorer, browser, messaging, calendar, task manager, and system tray.

- Use `chmod 400 ohio-instance.pem`

The screenshot shows the AWS EC2 Instances page. The left sidebar lists various services like EC2 Dashboard, Events, Tags, Limits, and Instances. Under Instances, it shows 'Instances New', Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, and Capacity Reservations. Below that is 'Images' with 'AMIs New'. The main content area displays 'Instances (1/3) Info' with a table of three running instances. The third instance, 'C-without-public-IP-in-Private-Subnet', is selected and highlighted with a red box. Its details are shown in a modal window titled 'Instance: i-0ef4f2e5961dc8a1c (C-without-public-IP-in-Private-Subnet)'. The modal has tabs for Details, Security, Networking, Storage, Status checks, Monitoring, and Tags. The Details tab is active, showing the Instance summary. It includes fields for Instance ID (i-0ef4f2e5961dc8a1c), Public IPv4 address (empty), Private IPv4 addresses (10.10.2.211), IPv6 address (empty), Instance state (Running), and Public IPv4 DNS (empty). A red box also highlights the 'Connect' button in the top right of the main EC2 Instances interface.

Name	Instance ID	Instance state	Instance type	Status
A-with-public-IP-in-Public-Subnet	i-04aff5fd885eda5	Running	t2.micro	2/2 c
B-without-public-IP-in-Public-Subnet	i-0c1243408f00ac298	Running	t2.micro	2/2 c
<b>C-without-public-IP-in-Private-Subnet</b>	<b>i-0ef4f2e5961dc8a1c</b>	<b>Running</b>	<b>t2.micro</b>	<b>2/2 c</b>

- Select 3<sup>rd</sup> instance
- Click on Connect

The screenshot shows the AWS EC2 Connect to instance page. The instance ID is `i-0ef4f2e5961dc8a1c`. The **SSH client** tab is selected. The page provides instructions for connecting via SSH:

- Open an SSH client.
- Locate your private key file. The key used to launch this instance is `ohio-instance.pem`.
- Run this command, if necessary, to ensure your key is not publicly viewable:  
`chmod 400 ohio-instance.pem`
- Connect to your instance using its Private IP:  
`10.10.2.211`

An example command is shown:

```
ssh -i "ohio-instance.pem" ec2-user@10.10.2.211
```

A note at the bottom states: **Note:** In most cases, the guessed user name is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI user name.

The browser address bar shows the URL: `us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#ConnectToInstance:instanceId=i-0ef4f2e5961dc8a1c`.

- Copy last command

The screenshot shows a MobaXterm window with a terminal session titled 'root@ip-10-10-1-241/'. The terminal displays a file listing from the root directory and several commands entered by the root user:

```
total 16
drwxr-xr-x  2 root root   6 Apr  9  2019 srv
drwxr-xr-x  2 root root   6 Apr  9  2019 mnt
drwxr-xr-x  2 root root   6 Apr  9  2019 media
drwxr-xr-x  2 root root  6 Mar  7 00:13 local
lrwxrwxrwx  1 root root   8 Mar  7 00:13 sbin -> usr/sbin
lrwxrwxrwx  1 root root   9 Mar  7 00:13 lib64 -> usr/lib64
lrwxrwxrwx  1 root root   7 Mar  7 00:13 lib -> usr/lib
lrwxrwxrwx  1 root root   7 Mar  7 00:13 bin -> usr/bin
drwxr-xr-x 13 root root  155 Mar  7 00:13 usr
drwxr-xr-x  4 root root  27 Mar  7 00:14 opt
dr-xr-xr-x  4 root root 4096 Mar  7 00:15 boot
dr-xr-xr-x 13 root root   0 Mar 11 06:44 sys
dr-xr-xr-x 156 root root   0 Mar 11 06:44 proc
drwxr-xr-x 19 root root  269 Mar 11 06:44 var
drwxr-xr-x 15 root root 2900 Mar 11 06:44 dev
drwxr-xr-x  3 root root  22 Mar 11 06:44 home
dr-xr-x--  3 root root 103 Mar 11 06:44 root
drwxr-xr-x  80 root root 8192 Mar 11 06:44 etc
drwxr-xr-x  28 root root  980 Mar 11 06:44 run
drwxrwxrwt  8 root root  172 Mar 11 06:44 tmp
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]# vi ohio-instance.pem
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]# chmod 400 ohio-instance.pem
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]#
[root@ip-10-10-1-241 /]# ssh -i "ohio-instance.pem" ec2-user@10.10.2.211
```

The command `ssh -i "ohio-instance.pem" ec2-user@10.10.2.211` is highlighted with a red box.

At the bottom of the terminal window, there is a watermark: **UNREGISTERED VERSION** - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>

The taskbar at the bottom of the screen shows various application icons and system status indicators.

- Paste in MobaXterm and Press Enter

```
ec2-user@ip-10-10-2-211:~$ cd /tmp
ec2-user@ip-10-10-2-211:~/tmp$ vi ohio-instance.pem
ec2-user@ip-10-10-2-211:~/tmp$ chmod 400 ohio-instance.pem
ec2-user@ip-10-10-2-211:~/tmp$ ssh -i "ohio-instance.pem" ec2-user@10.10.2.211
The authenticity of host '10.10.2.211 (10.10.2.211)' can't be established.
ECDSA key fingerprint is SHA256:E8M2Zs8m4JMQUcy3P+0Ry2r4vHdFL+lfic8mNsoHER8.
ECDSA key fingerprint is MD5:0d:31:ac:8b:6c:ee:06:cf:bd:10:e4:e8:25:b2:84:b3.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.10.2.211' (ECDSA) to the list of known hosts.

      _|_ ( _|_ )
      _| \_ |_ |   Amazon Linux 2 AMI

https://aws.amazon.com/amazon-linux-2/
No packages needed for security; 5 packages available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-10-10-2-211 ~]$
```

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- Enter yes and press enter
- Here you can see that you are connected to 3<sup>rd</sup> instance.

[root@ip-10-10-1-241 ~]# ssh -i "ohio-instance.pem" ec2-user@10.10.2.211  
The authenticity of host '10.10.2.211 (10.10.2.211)' can't be established.  
ECDSA key fingerprint is SHA256:E8M2Zs8m4JMQUcy3P+0Ry2r4vHdFL+lfic8mNs0HER8.  
ECDSA key fingerprint is MD5:0d:31:ac:8b:6c:ee:06:cf:bd:10:e4:e8:25:b2:84:b3.  
Are you sure you want to continue connecting (yes/no)? yes  
Warning: Permanently added '10.10.2.211' (ECDSA) to the list of known hosts.

\_|\_ / \_/\_ )  
| ( \_/\_ / Amazon Linux 2 AMI  
\_\_|\_\\_|\_ |

<https://aws.amazon.com/amazon-linux-2/>  
No packages needed for security; 5 packages available  
Run "sudo yum update" to apply all updates.  
[ec2-user@ip-10-10-2-211 ~]\$  
[ec2-user@ip-10-10-2-211 ~]\$  
[ec2-user@ip-10-10-2-211 ~]\$ ping google.com  
PING google.com (142.250.190.110) 56(84) bytes of data.  
64 bytes from ord37s35-in-f14.1e100.net (142.250.190.110): icmp\_seq=1 ttl=34 time=18.2 ms  
64 bytes from ord37s35-in-f14.1e100.net (142.250.190.110): icmp\_seq=2 ttl=34 time=17.9 ms  
64 bytes from ord37s35-in-f14.1e100.net (142.250.190.110): icmp\_seq=3 ttl=34 time=17.8 ms  
64 bytes from ord37s35-in-f14.1e100.net (142.250.190.110): icmp\_seq=4 ttl=34 time=17.7 ms  
64 bytes from ord37s35-in-f14.1e100.net (142.250.190.110): icmp\_seq=5 ttl=34 time=17.9 ms

--- google.com ping statistics ---  
5 packets transmitted, 5 received, 0% packet loss, time 4005ms  
rtt min/avg/max/mdev = 17.799/17.968/18.277/0.163 ms

[ec2-user@ip-10-10-2-211 ~]\$  
[ec2-user@ip-10-10-2-211 ~]\$  
[ec2-user@ip-10-10-2-211 ~]\$  
[ec2-user@ip-10-10-2-211 ~]\$  
[ec2-user@ip-10-10-2-211 ~]\$

- Use `ping google.com`
  - Here we can see that our ping command is running fine because this instance is in private subnet and this private subnet is connected to NAT Gateway.

- So here we have seen that working of **Internet gateway** in Public Subnet.
- Also we have seen that working of **NAT gateway** in Private Subnet.
- All the working is totally depend upon Route Table entry and Subnet Associations with respect to particular **Gateway**.
- Also while creating VPC and Subnet enter **CIDR** correctly.

**Thanks for Doing Practical with Us**