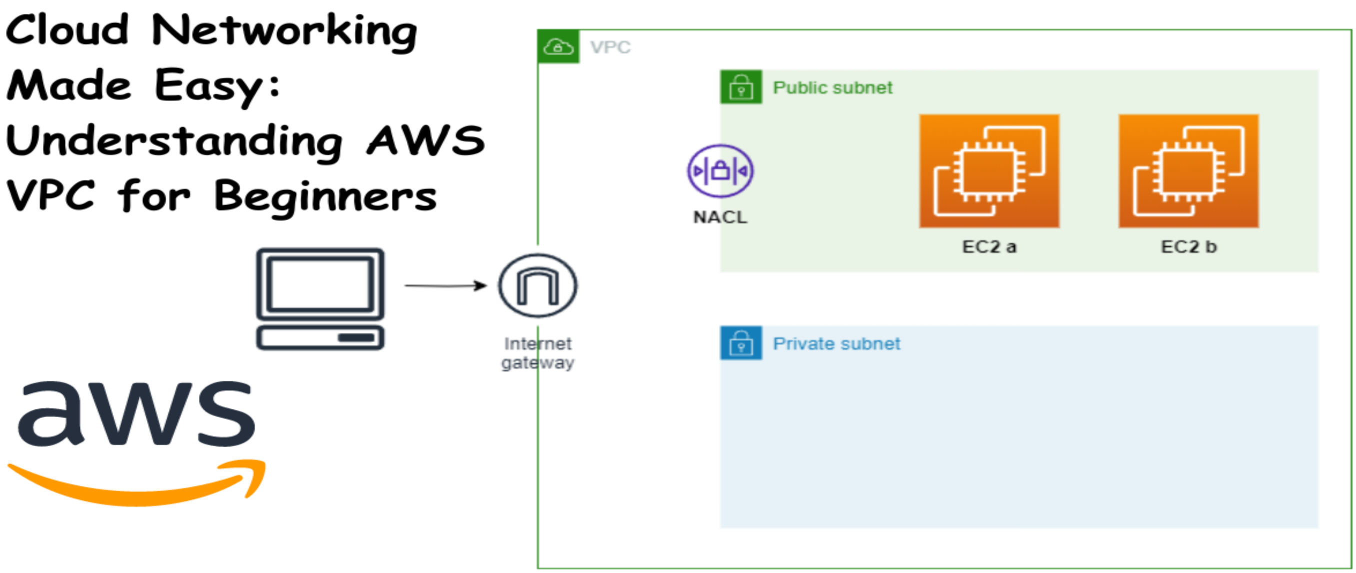

Cloud Networking Made Easy: Understanding AWS VPC for Beginners
aws
Internet gateway
VPC
Public subnet
NACL
EC2 a
EC2 b
Private subnet

Beginner's Guide to AWS VPC: Building Your Cloud Network

Table of contents :-

1] Why AWS VPC Matters ?

In the world of cloud computing, AWS VPC (Virtual Private Cloud) is your passport to creating your own isolated piece of the cloud. Imagine you're building your digital town, complete with houses (resources) and neighborhoods (subnets). AWS VPC lets you control who gets to visit and who stays out, ensuring your resources are secure and organized.

By using AWS VPC, you gain:

1. **Security:** You can set up virtual gates, like security guards, controlling who enters your digital town. This prevents unauthorized access to your resources.

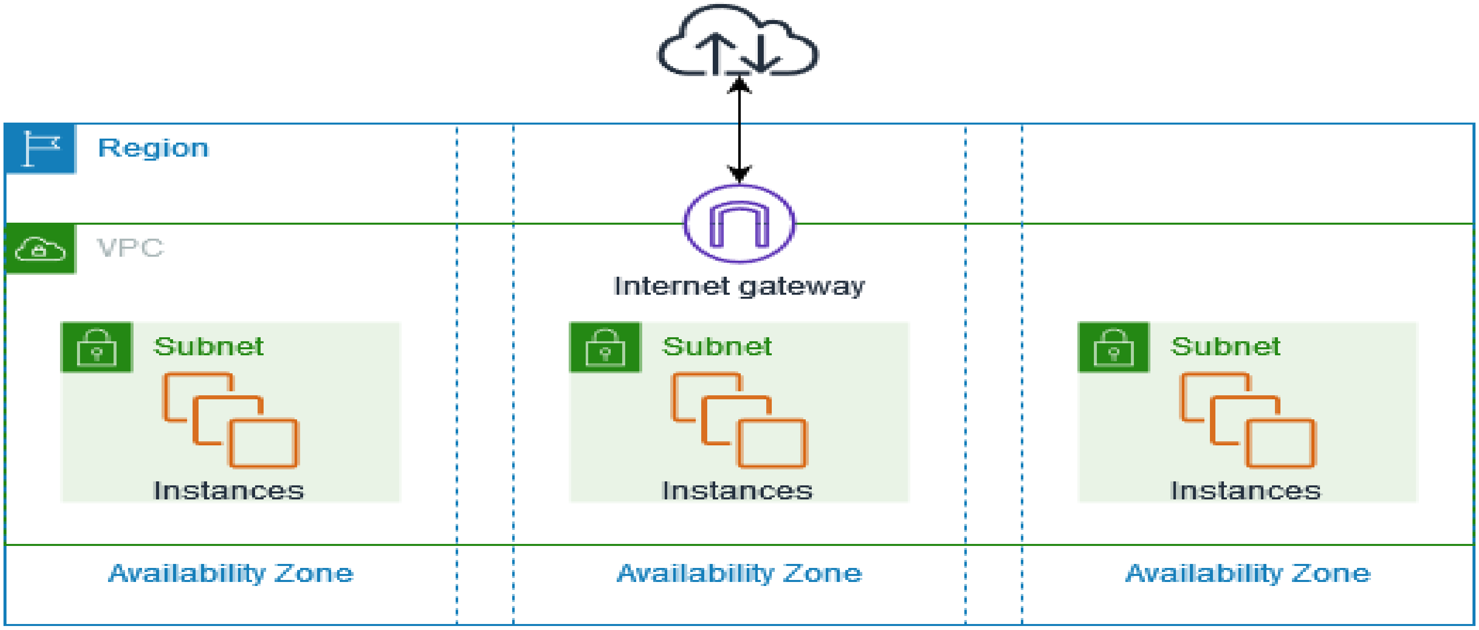
2. **Isolation:** Just as each neighborhood in a real town has its own character, you can create separate subnets for different purposes, keeping your web servers, databases, and other services in their own safe spaces.
3. **Customization:** Like choosing paint colors for your houses, you get to decide on IP addresses, routing rules, and network settings tailored to your needs.

2] What is AWS VPC?

AWS VPC is your playground in the cloud. It's where you design, build, and manage your networked resources. Here's a quick look at the key components:

1. **Subnets:** Think of these as neighborhoods within your town. Public subnets face the main road (the internet), while private subnets are tucked away. A subnet is a range of IP addresses in your VPC.
2. **Internet Gateway:** Just like a main road leading to your town, it connects your VPC to the world wide web. An Internet Gateway allows your instances to access the internet.
3. **NAT Gateway:** This is the secret passage for your private houses (resources) to access the internet without exposing themselves. A Network Address Translation (NAT) Gateway allows instances in private subnets to connect to the internet.
4. **Security Groups:** These are like vigilant security guards stationed at each house's door. They decide who's allowed to come in. Security groups act as a virtual firewall for your instances.
5. **Network ACLs:** Consider these as community rules posted at the entrance of each neighborhood, controlling who can enter and exit. Network Access Control Lists (ACLs) are stateless and provide an added layer of security.

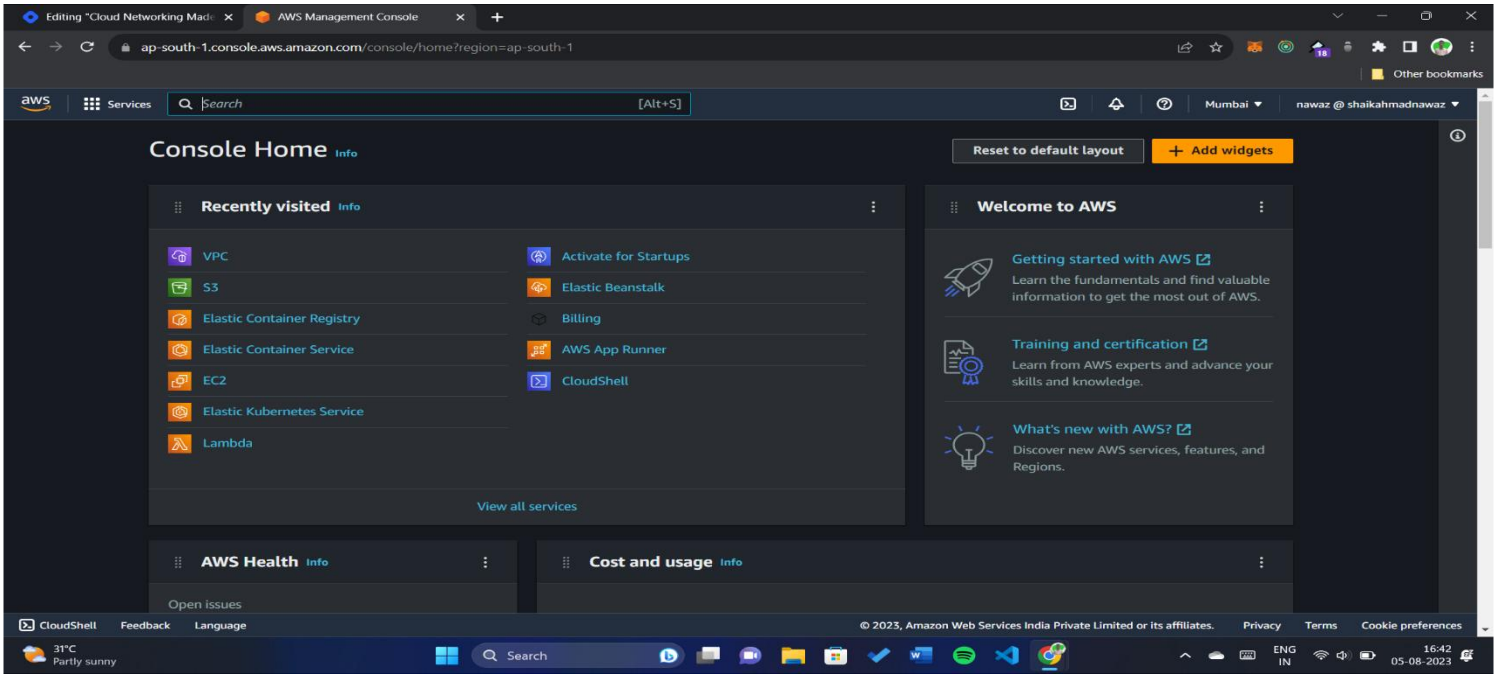
The following diagram shows an example VPC. The VPC has one subnet in each of the Availability Zones in the Region, EC2 instances in each subnet, and an internet gateway to allow communication between the resources in your VPC and the internet.



3] How to Create Your Own AWS VPC

Creating your own AWS VPC is easier than you might think. Here's a simplified step-by-step guide:

1. **Navigate to the AWS Management Console:** This is like finding the entrance to your cloud town.



Learn the fundamentals and find valuable information to get the most out of AWS.

Learn from AWS experts and advance your skills and knowledge.

Discover new AWS services, features, and Regions.

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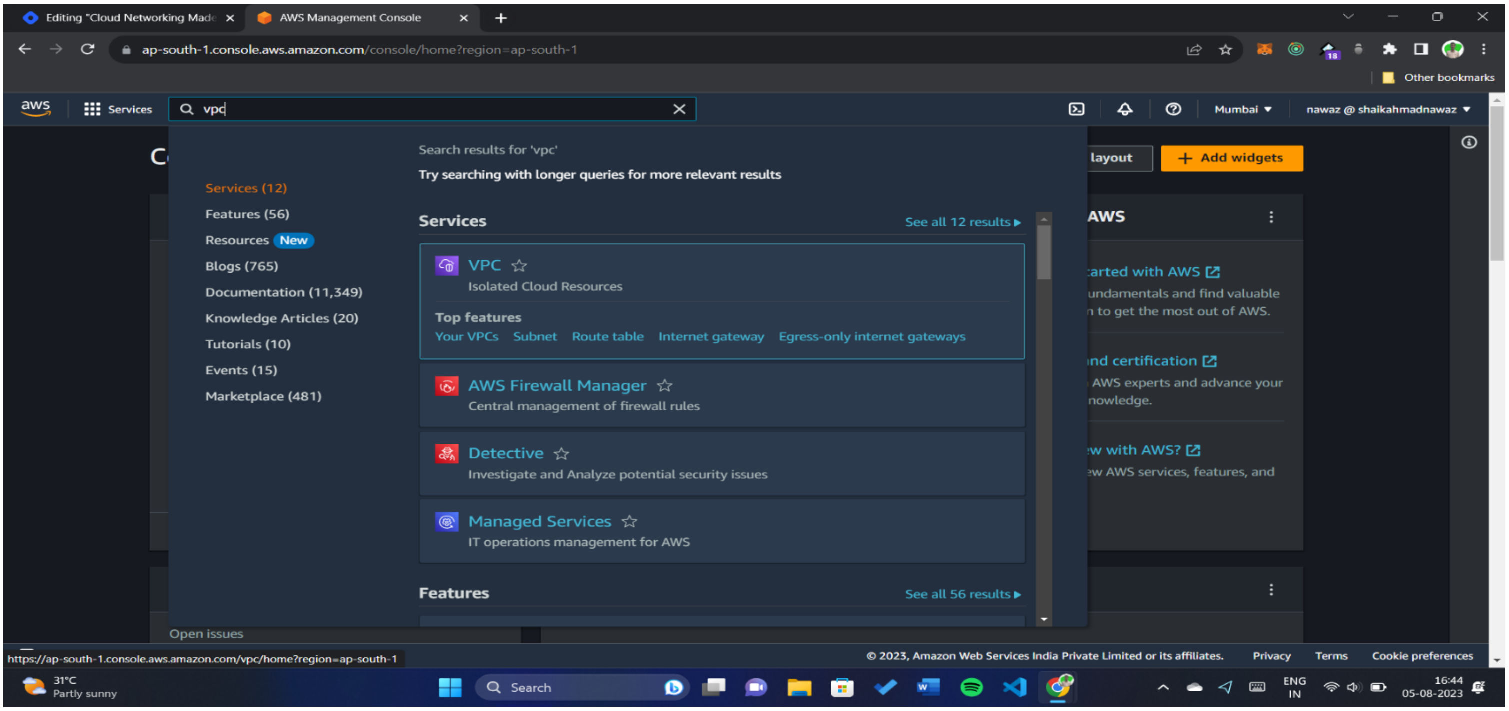
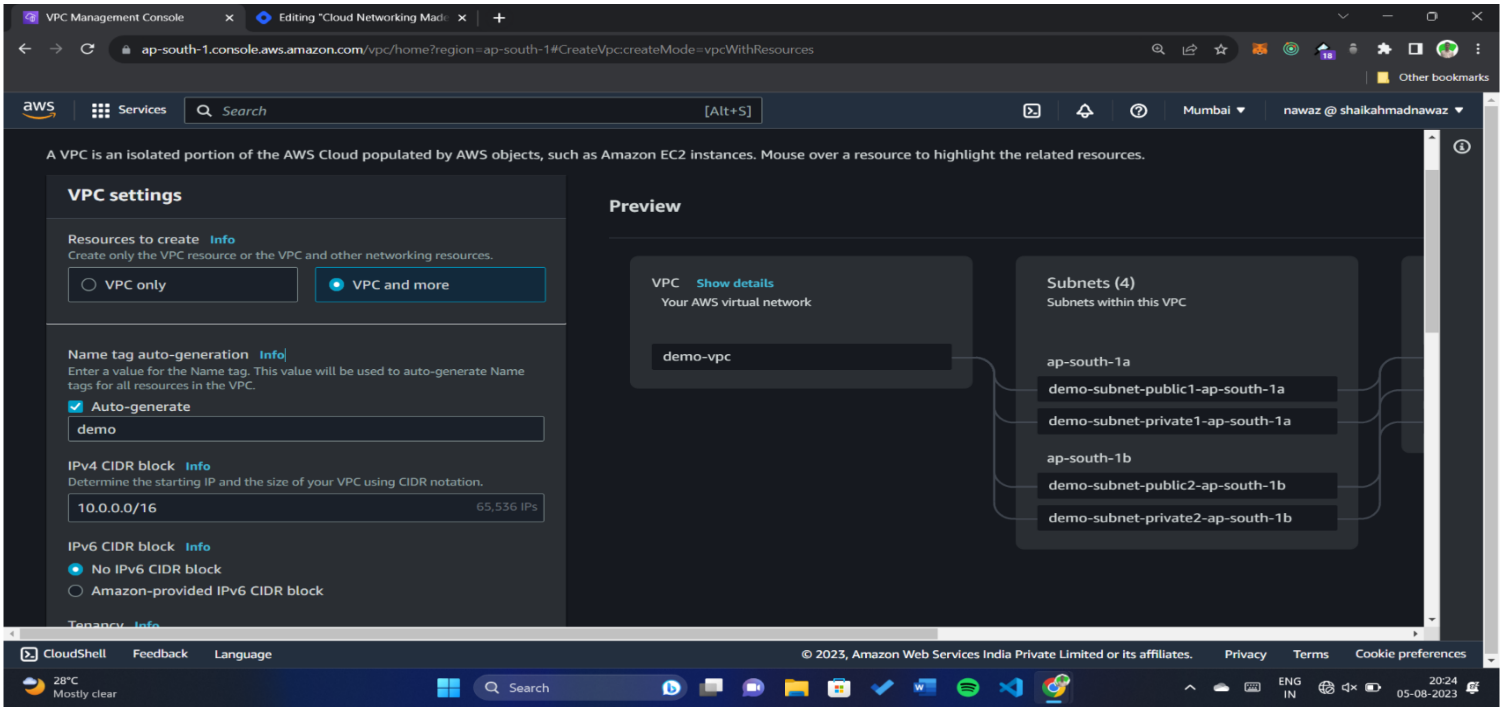
2. **Choose "VPC" from the Services Menu:** Think of this as reaching the town planning office.



Search results for 'vpc'

Try searching with longer queries for more relevant results

3. **Click "Create VPC":** This is where you name your town and set its address range (CIDR block).



A VPC is an isolated portion of the AWS Cloud populated by AWS objects, such as Amazon EC2 instances. Mouse over a resource to highlight the related resources.

VPC settings

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

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

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

IPv6 CIDR block Info
● No IPv6 CIDR block
○ Amazon-provided IPv6 CIDR block

Tenancy Info

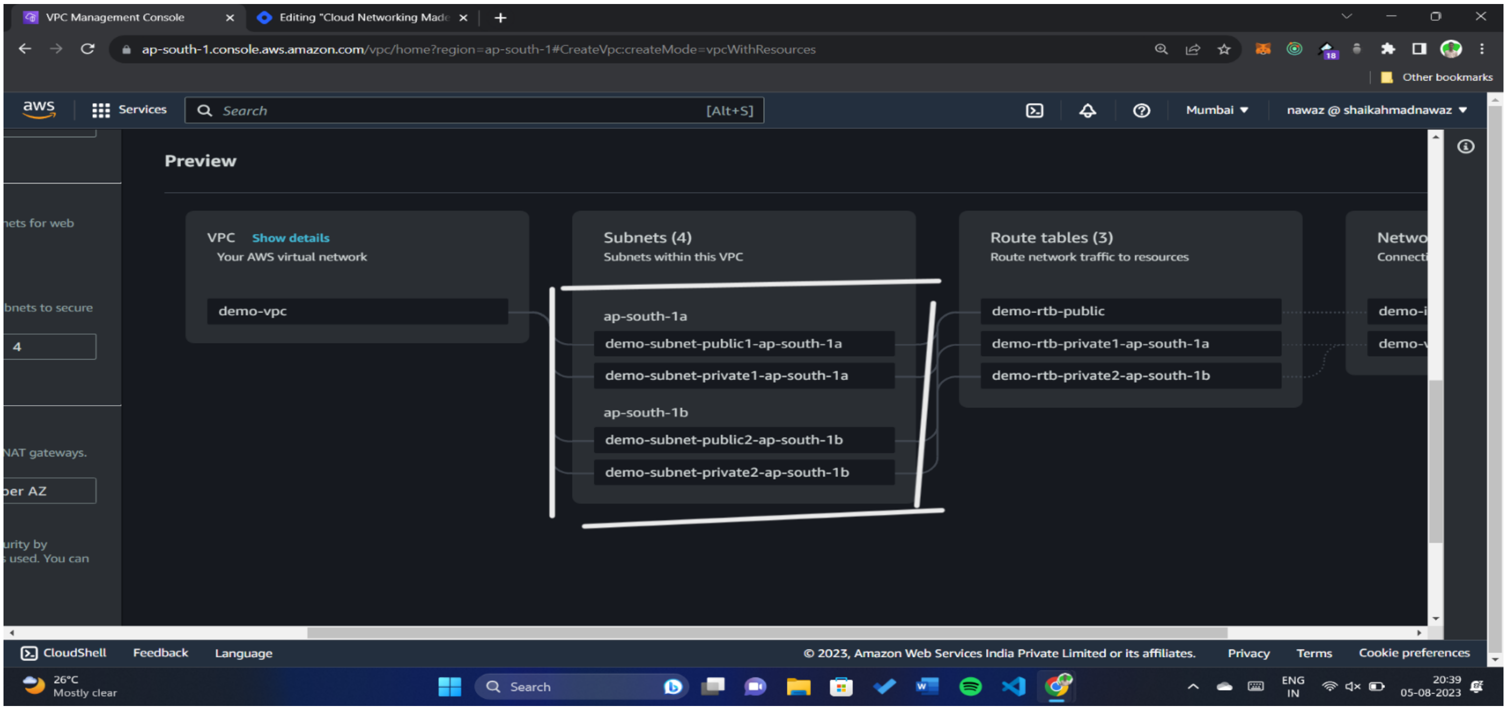
Preview

VPC Show details
Your AWS virtual network
demo-vpc

Subnets (4)
Subnets within this VPC
ap-south-1a
demo-subnet-public1-ap-south-1a
demo-subnet-private1-ap-south-1a
ap-south-1b
demo-subnet-public2-ap-south-1b
demo-subnet-private2-ap-south-1b

VPC Management Console
Editing "Cloud Networking Made
ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#CreateVpc:createMode=vpcWithResources
Other bookmarks
aws
Services
Search
[Alt+S]
Mumbai ▾
nawaz @ shaikahmadnawaz ▾
CloudShell
Feedback
Language
© 2023, Amazon Web Services India Private Limited or its affiliates.
Privacy
Terms
Cookie preferences
28°C
Mostly clear
Search
ENG
IN
20:24
05-08-2023

4. **Create Subnets:** Just like dividing your town into neighborhoods, create subnets for different purposes. Public ones can be used for resources that need direct internet access, while private ones are ideal for internal services.

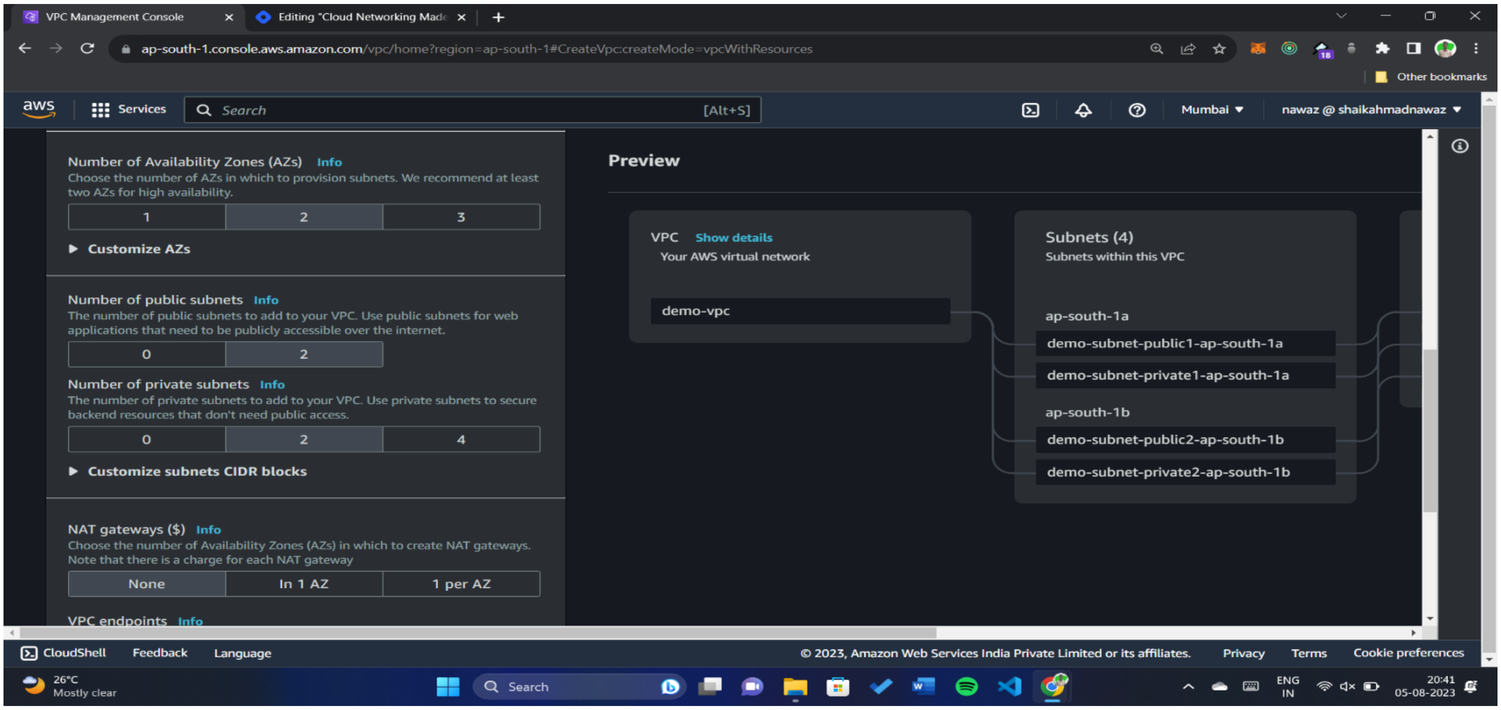

ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#CreateVpc:createMode=vpcWithResources

Preview

VPC Show details
Your AWS virtual network
demo-vpc

Subnets (4)
Subnets within this VPC
ap-south-1a
demo-subnet-public1-ap-south-1a
demo-subnet-private1-ap-south-1a
ap-south-1b
demo-subnet-public2-ap-south-1b
demo-subnet-private2-ap-south-1b

Route tables (3)
Route network traffic to resources
demo-rtb-public
demo-rtb-private1-ap-south-1a
demo-rtb-private2-ap-south-1b


ap-south-1.console.aws.amazon.com/vpc/home?region=ap-south-1#CreateVpc:createMode=vpcWithResources

Number of Availability Zones (AZs) Info
Choose the number of AZs in which to provision subnets. We recommend at least two AZs for high availability.
1 | 2 | 3

▶ Customize AZs

Number of public subnets Info
The number of public subnets to add to your VPC. Use public subnets for web applications that need to be publicly accessible over the internet.
0 | 2

Number of private subnets Info
The number of private subnets to add to your VPC. Use private subnets to secure backend resources that don't need public access.
0 | 2 | 4

▶ Customize subnets CIDR blocks

NAT gateways ($) Info
Choose the number of Availability Zones (AZs) in which to create NAT gateways. Note that there is a charge for each NAT gateway
None | In 1 AZ | 1 per AZ

VPC endpoints Info

Preview

VPC Show details
Your AWS virtual network
demo-vpc

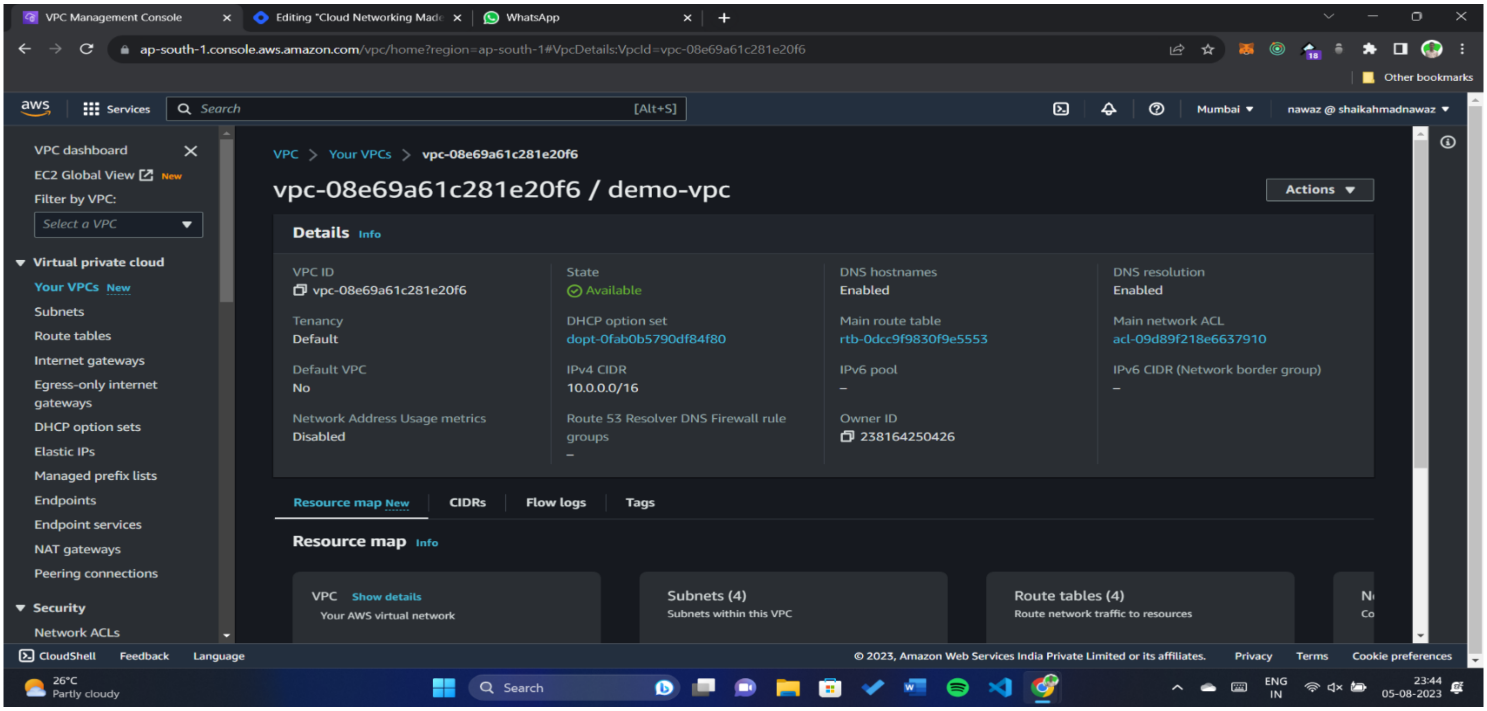
Subnets (4)
Subnets within this VPC
ap-south-1a
demo-subnet-public1-ap-south-1a
demo-subnet-private1-ap-south-1a
ap-south-1b
demo-subnet-public2-ap-south-1b
demo-subnet-private2-ap-south-1b

5. **Set Up Internet Gateway:** Build the main road to the internet by creating an Internet Gateway and attaching it to your VPC.

6. **Configure Route Tables:** Think of these as street signs that tell traffic where to go. Direct public traffic to the internet gateway, and private traffic to a NAT gateway.

7. **Security Groups and Network ACLs:** Assign security guards (security groups) to each house and put up community rules (network ACLs) for the neighborhoods.

Launch Resources: Start building your houses (launch instances) in your chosen subnets. They will automatically follow the rules you've set.



vpc-08e69a61c281e20f6 / demo-vpc

Details Info

VPC ID vpc-08e69a61c281e20f6	State Available	DNS hostnames Enabled	DNS resolution Enabled
Tenancy Default	DHCP option set dopt-0fab0b5790df84f80	Main route table rtb-0dcc9f9830f9e5553	Main network ACL acl-09d89f218e6637910
Default VPC No	IPv4 CIDR 10.0.0.0/16	IPv6 pool –	IPv6 CIDR (Network border group) –
Network Address Usage metrics Disabled	Route 53 Resolver DNS Firewall rule groups –	Owner ID 238164250426	

Resource map Info

VPC Show details
Your AWS virtual network

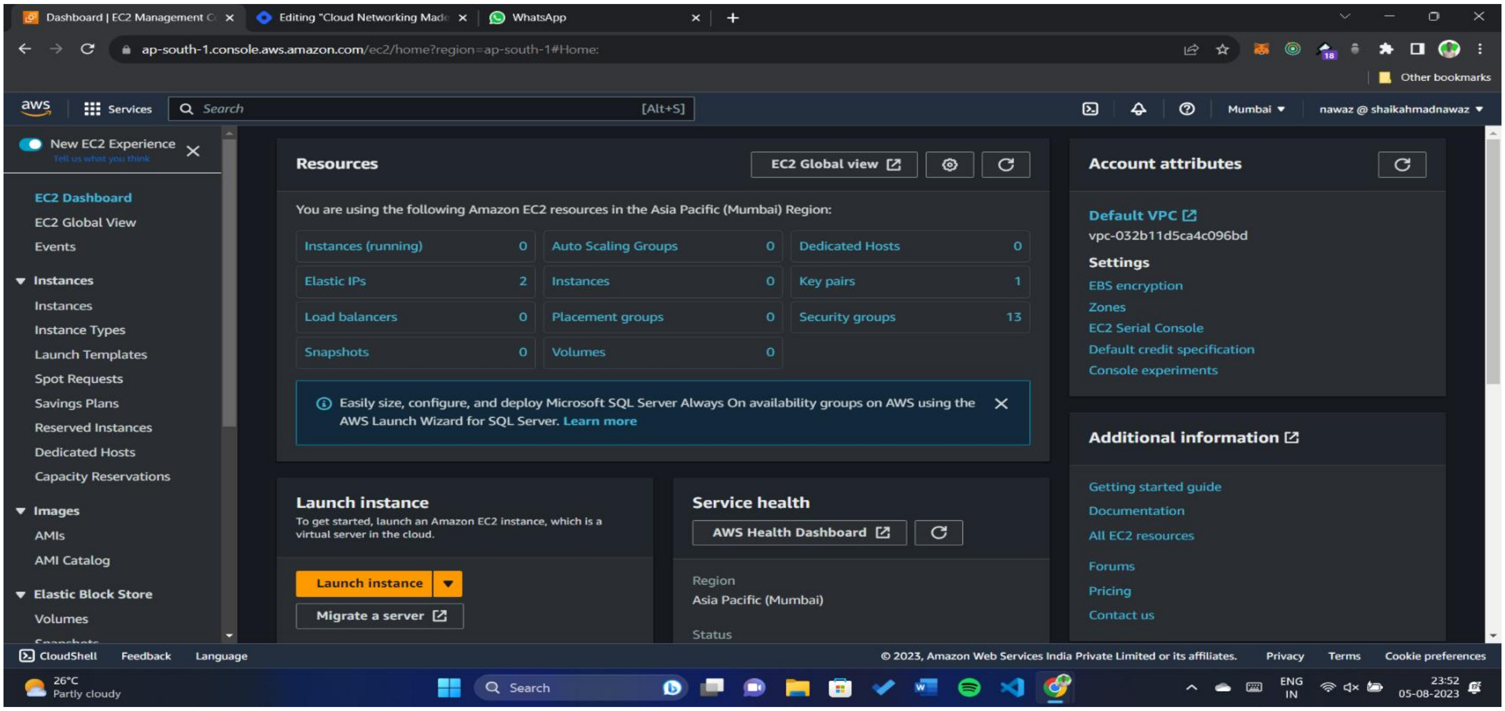
Subnets (4)
Subnets within this VPC

Route tables (4)
Route network traffic to resources

4] Launching Your First House: Creating an EC2 Instance

Now that you've built your town (AWS VPC) and set up its neighborhoods (subnets) and roads (gateways), it's time to add some houses (resources). Let's start by launching an EC2 instance, which is like constructing your first building.

1. **Navigate to EC2 Dashboard:** Think of this as opening the blueprint for your house.



Resources

You are using the following Amazon EC2 resources in the Asia Pacific (Mumbai) Region:

Instances (running)	0	Auto Scaling Groups	0	Dedicated Hosts	0
Elastic IPs	2	Instances	0	Key pairs	1
Load balancers	0	Placement groups	0	Security groups	13
Snapshots	0	Volumes	0		

Easily size, configure, and deploy Microsoft SQL Server Always On availability groups on AWS using the AWS Launch Wizard for SQL Server. Learn more

Launch instance

To get started, launch an Amazon EC2 instance, which is a virtual server in the cloud.

Service health

Region
Asia Pacific (Mumbai)

Status

Account attributes

Default VPC
vpc-032b11d5ca4c096bd

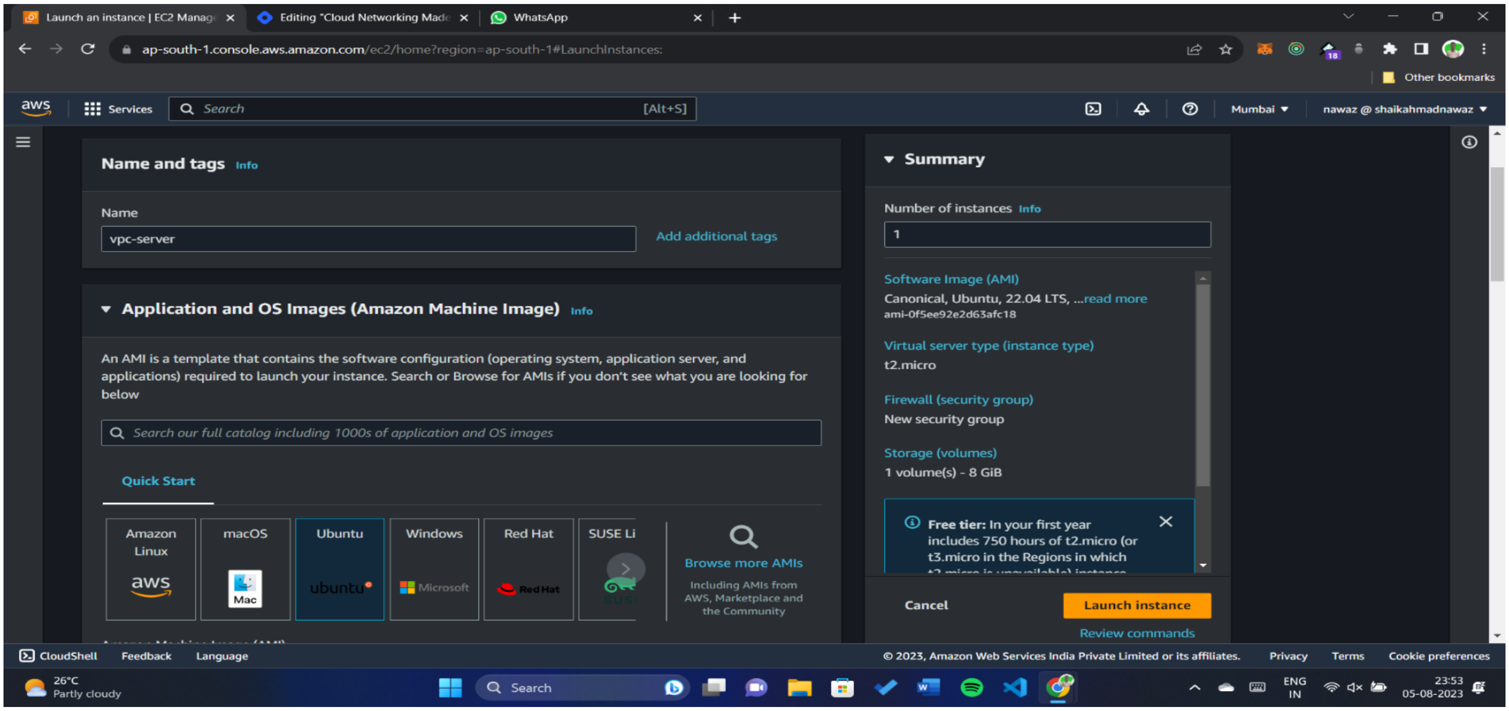
Settings
EBS encryption
Zones
EC2 Serial Console
Default credit specification
Console experiments

Additional information

Getting started guide
Documentation
All EC2 resources
Forums
Pricing
Contact us

2. **Launch an Instance:** Click the "Launch Instance" button, which is equivalent to laying the foundation of your building.

3. **Choose an Amazon Machine Image (AMI):** This is like selecting the design and style of your house. Choose an operating system that fits your needs.



Name and tags Info

Name: vpc-server

Add additional tags

Application and OS Images (Amazon Machine Image) Info

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

Search our full catalog including 1000s of application and OS images

Summary

Number of instances Info: 1

Software Image (AMI)
Canonical, Ubuntu, 22.04 LTS, ...read more
ami-0f5ee92e2d63afc18

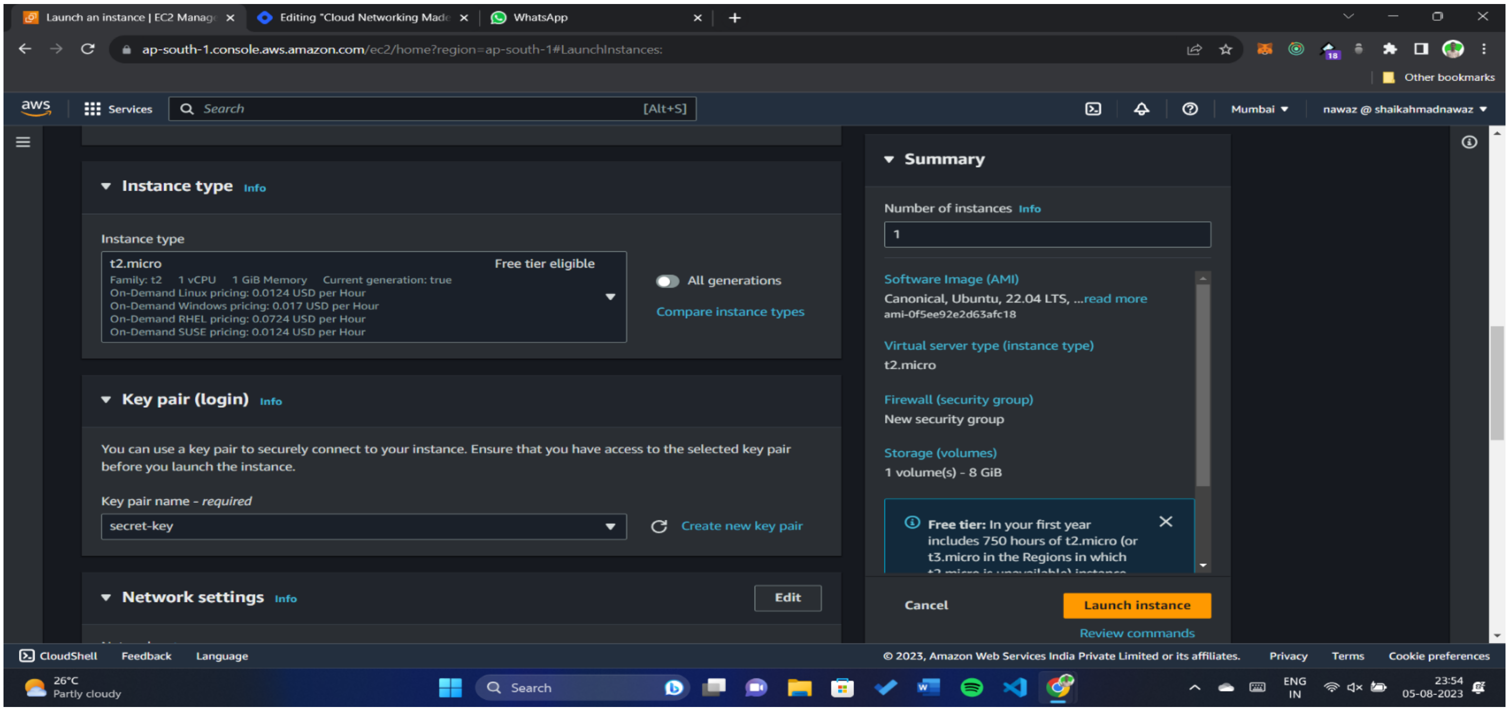
Virtual server type (instance type)
t2.micro

Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which

4. **Choose an Instance Type:** Think of this as picking the size and layout of your house. Different instance types offer varying amounts of CPU, memory, and other resources.



Instance type Info

Instance type

t2.micro — Free tier eligible
Family: t2 1 vCPU 1 GiB Memory Current generation: true
On-Demand Linux pricing: 0.0124 USD per Hour
On-Demand Windows pricing: 0.017 USD per Hour
On-Demand RHEL pricing: 0.0724 USD per Hour
On-Demand SUSE pricing: 0.0124 USD per Hour

Key pair (login) Info

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

Key pair name - *required*: secret-key

Network settings Info

Summary

Number of instances Info: 1

Software Image (AMI)
Canonical, Ubuntu, 22.04 LTS, ...read more
ami-0f5ee92e2d63afc18

Virtual server type (instance type)
t2.micro

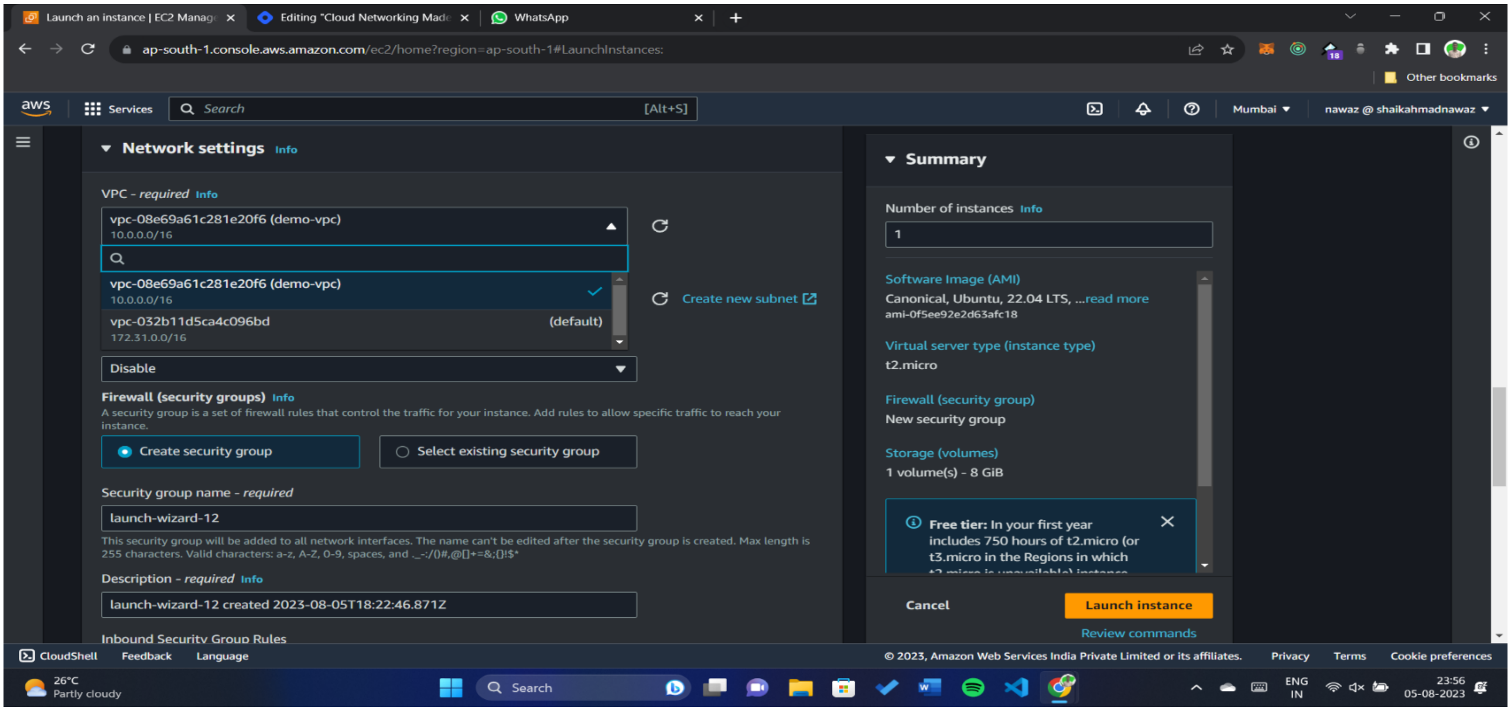
Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which

5. **Configure Instance Details:** Here, you're specifying where your house will be built. Choose the VPC and subnet where you want to place your EC2 instance. This is where

the magic happens – your house will automatically follow the rules you've set for that subnet.


Launch an instance | EC2 Manag
Editing "Cloud Networking Made
WhatsApp
ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#LaunchInstances:
Other bookmarks
aws
Services
Search
[Alt+S]
Mumbai
nawaz @ shaikahmadnawaz
CloudShell
Feedback
Language
© 2023, Amazon Web Services India Private Limited or its affiliates.
Privacy
Terms
Cookie preferences
26°C
Partly cloudy
Search
ENG
IN
23:56
05-08-2023

Network settings Info

VPC - *required* Info

vpc-08e69a61c281e20f6 (demo-vpc)
10.0.0.0/16

vpc-08e69a61c281e20f6 (demo-vpc) ✓
10.0.0.0/16

vpc-032b11d5ca4c096bd (default)
172.31.0.0/16

Create new subnet

Disable

Firewall (security groups) Info

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

● Create security group ○ Select existing security group

Security group name - *required*

launch-wizard-12

This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and ._-:/()#,@[]+=&;{}!$*

Description - *required* Info

launch-wizard-12 created 2023-08-05T18:22:46.871Z

Inbound Security Group Rules

Summary

Number of instances Info

1

Software Image (AMI)
Canonical, Ubuntu, 22.04 LTS, ...read more
ami-0f5ee92e2d63afc18

Virtual server type (instance type)
t2.micro

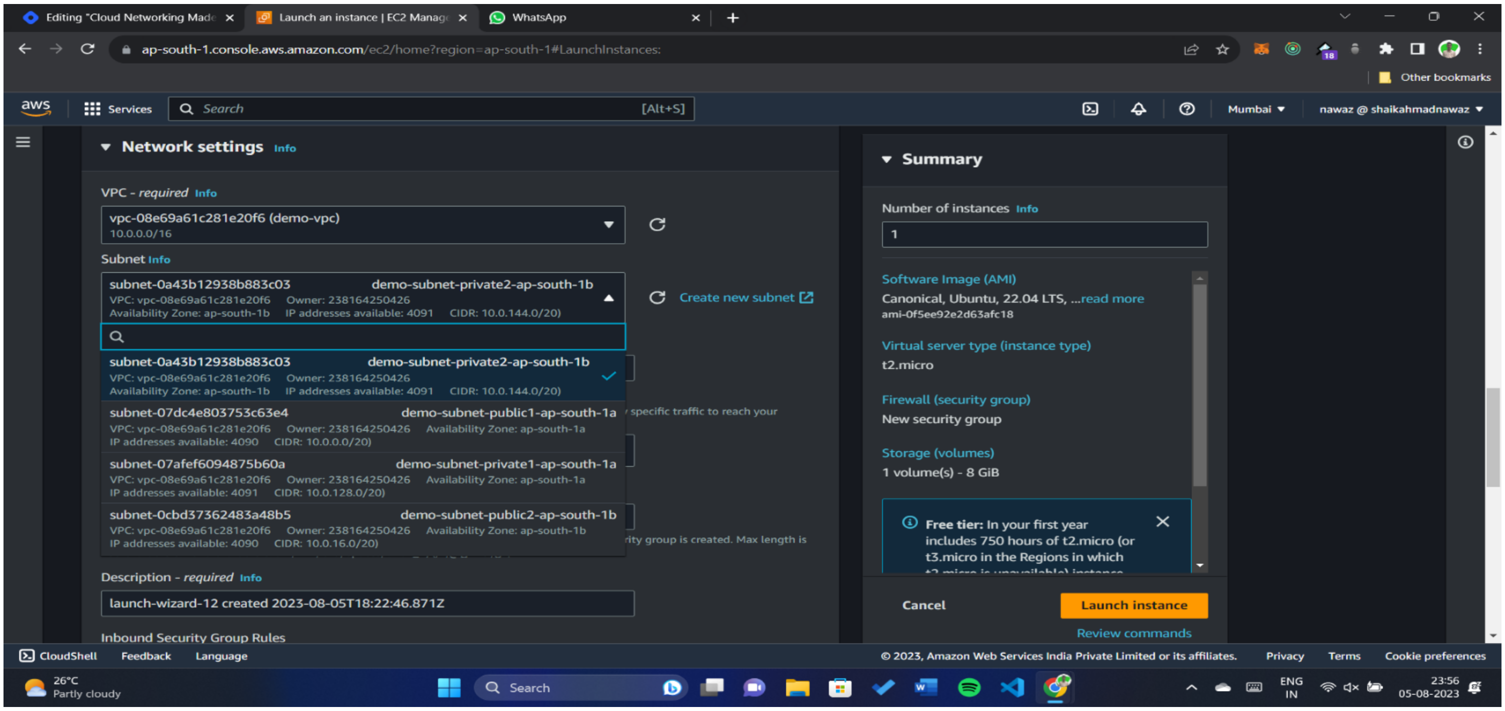
Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which

Cancel Launch instance

Review commands


Editing "Cloud Networking Made
Launch an instance | EC2 Manag
WhatsApp
ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#LaunchInstances:
Other bookmarks
aws
Services
Search
[Alt+S]
Mumbai
nawaz @ shaikahmadnawaz
CloudShell
Feedback
Language
© 2023, Amazon Web Services India Private Limited or its affiliates.
Privacy
Terms
Cookie preferences
26°C
Partly cloudy
Search
ENG
IN
23:56
05-08-2023

Network settings Info

VPC - *required* Info

vpc-08e69a61c281e20f6 (demo-vpc)
10.0.0.0/16

Subnet Info

subnet-0a43b12938b883c03 demo-subnet-private2-ap-south-1b
VPC: vpc-08e69a61c281e20f6 Owner: 238164250426
Availability Zone: ap-south-1b IP addresses available: 4091 CIDR: 10.0.144.0/20)

subnet-0a43b12938b883c03 demo-subnet-private2-ap-south-1b ✓
VPC: vpc-08e69a61c281e20f6 Owner: 238164250426
Availability Zone: ap-south-1b IP addresses available: 4091 CIDR: 10.0.144.0/20)

subnet-07dc4e803753c63e4 demo-subnet-public1-ap-south-1a
VPC: vpc-08e69a61c281e20f6 Owner: 238164250426 Availability Zone: ap-south-1a
IP addresses available: 4090 CIDR: 10.0.0.0/20)

subnet-07afef6094875b60a demo-subnet-private1-ap-south-1a
VPC: vpc-08e69a61c281e20f6 Owner: 238164250426 Availability Zone: ap-south-1a
IP addresses available: 4091 CIDR: 10.0.128.0/20)

subnet-0cbd37362483a48b5 demo-subnet-public2-ap-south-1b
VPC: vpc-08e69a61c281e20f6 Owner: 238164250426 Availability Zone: ap-south-1b
IP addresses available: 4090 CIDR: 10.0.16.0/20)

Create new subnet

Description - *required* Info

launch-wizard-12 created 2023-08-05T18:22:46.871Z

Inbound Security Group Rules

Summary

Number of instances Info

1

Software Image (AMI)
Canonical, Ubuntu, 22.04 LTS, ...read more
ami-0f5ee92e2d63afc18

Virtual server type (instance type)
t2.micro

Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which

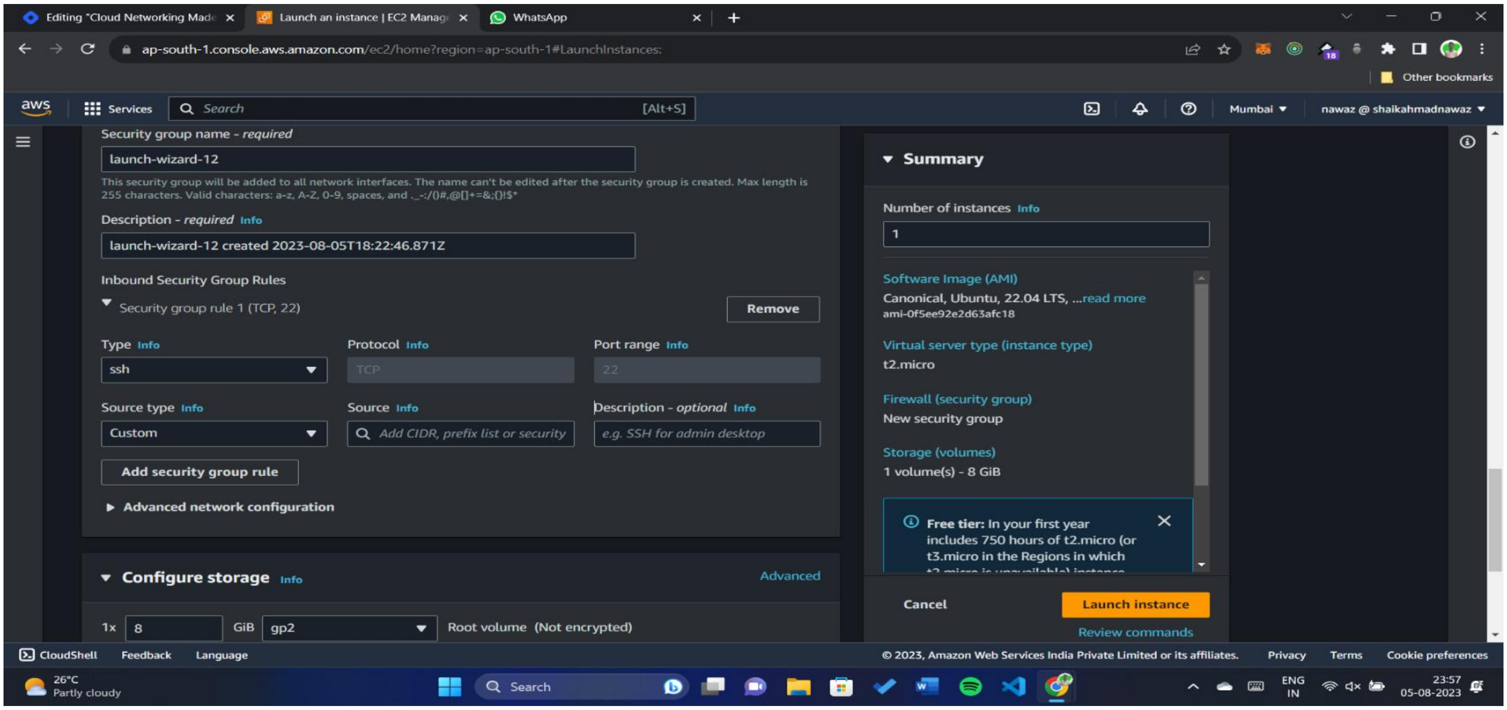
Cancel Launch instance

Review commands

6. **Add Storage:** Just as houses need rooms, your instance needs storage space. Configure the amount and type of storage you need.

7. **Add Tags:** Consider this step as putting a nameplate on your house. Tags help you identify and organize your resources.

8. **Configure Security Group:** Here's where you decide who's allowed to visit your house. Configure the security group to allow specific incoming and outgoing traffic.



Security group name - *required*

launch-wizard-12

This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and ._-:/()#,@[]+=&;{}!$*

Description - *required* Info

launch-wizard-12 created 2023-08-05T18:22:46.871Z

Inbound Security Group Rules

Security group rule 1 (TCP, 22)

Type: ssh | Protocol: TCP | Port range: 22

Source type: Custom | Source: *Add CIDR, prefix list or security* | Description - *optional*: *e.g. SSH for admin desktop*

Configure storage

1x 8 GiB gp2 Root volume (Not encrypted)

Summary

Number of instances: 1

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Canonical, Ubuntu, 22.04 LTS, ...read more
ami-0f5ee92e2d63afc18

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t2.micro

Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance

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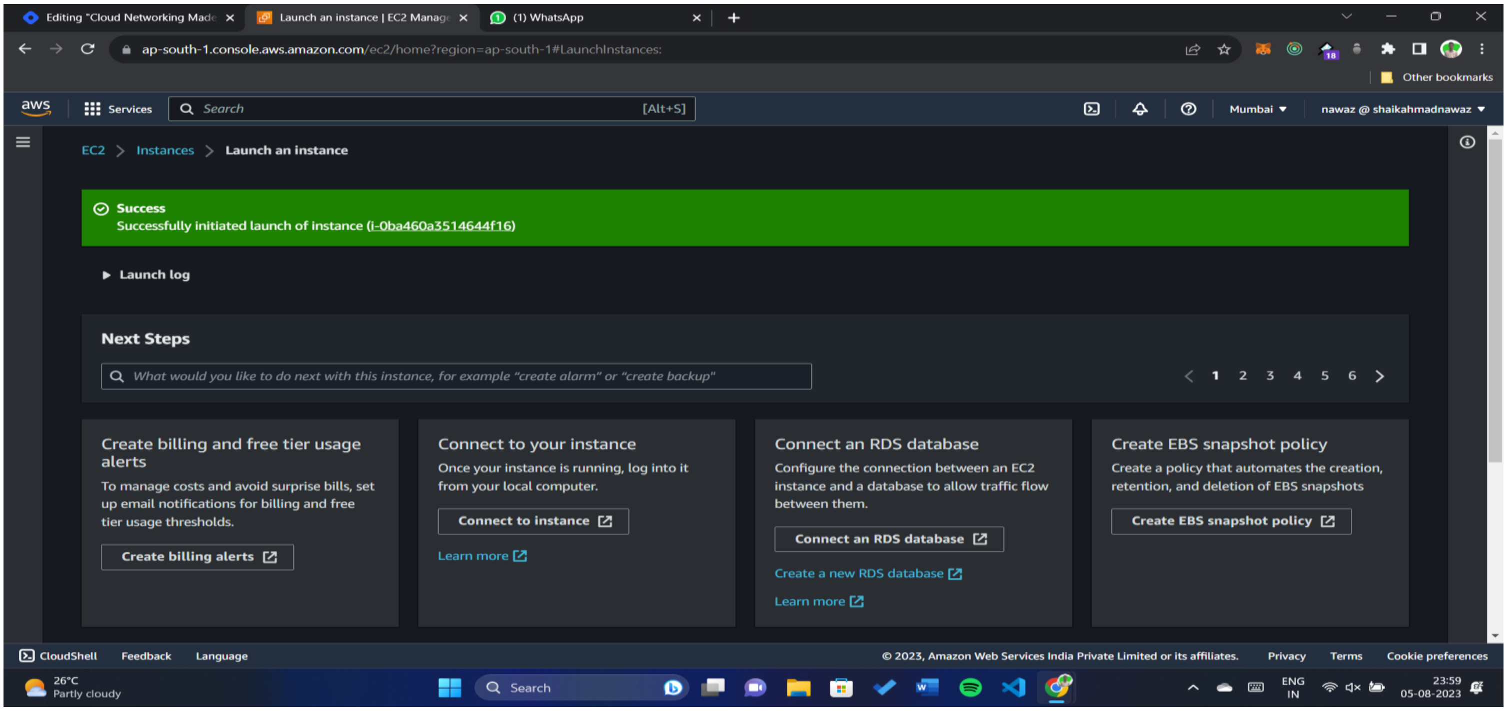
9. **Review and Launch:** This is your final inspection before moving in. Double-check your settings and click "Launch" if everything looks good.



Success
Successfully initiated launch of instance (i-0ba460a3514644f16)

Next Steps

What would you like to do next with this instance, for example "create alarm" or "create backup"

Create billing and free tier usage alerts
To manage costs and avoid surprise bills, set up email notifications for billing and free tier usage thresholds.

Connect to your instance
Once your instance is running, log into it from your local computer.

Connect an RDS database
Configure the connection between an EC2 instance and a database to allow traffic flow between them.

Create EBS snapshot policy
Create a policy that automates the creation, retention, and deletion of EBS snapshots

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Congratulations! You've built and moved into your first house (EC2 instance) in your AWS VPC. It's sitting comfortably in the neighborhood (subnet) you chose, following the rules you've set. You can now access it and use it for various purposes, just like you would with a real house.

5] Conclusion

AWS VPC might sound complex, but it's your tool for mastering cloud networking. You've learned why it matters – for security, isolation, and customization. You've explored its components – from subnets to gateways. And you've practically built your own town and even moved into your first house using an EC2 instance.

Remember, AWS VPC is your canvas to design and create your cloud environment, with the power to secure and structure your resources your way. As you continue your cloud journey, keep exploring and experimenting with AWS VPC to unlock its full potential.

Now that you have a solid understanding of AWS VPC basics, you're ready to dive deeper and explore the limitless possibilities of cloud networking.