



## **Module 8: Case Study - 1**

## Problem Statement:

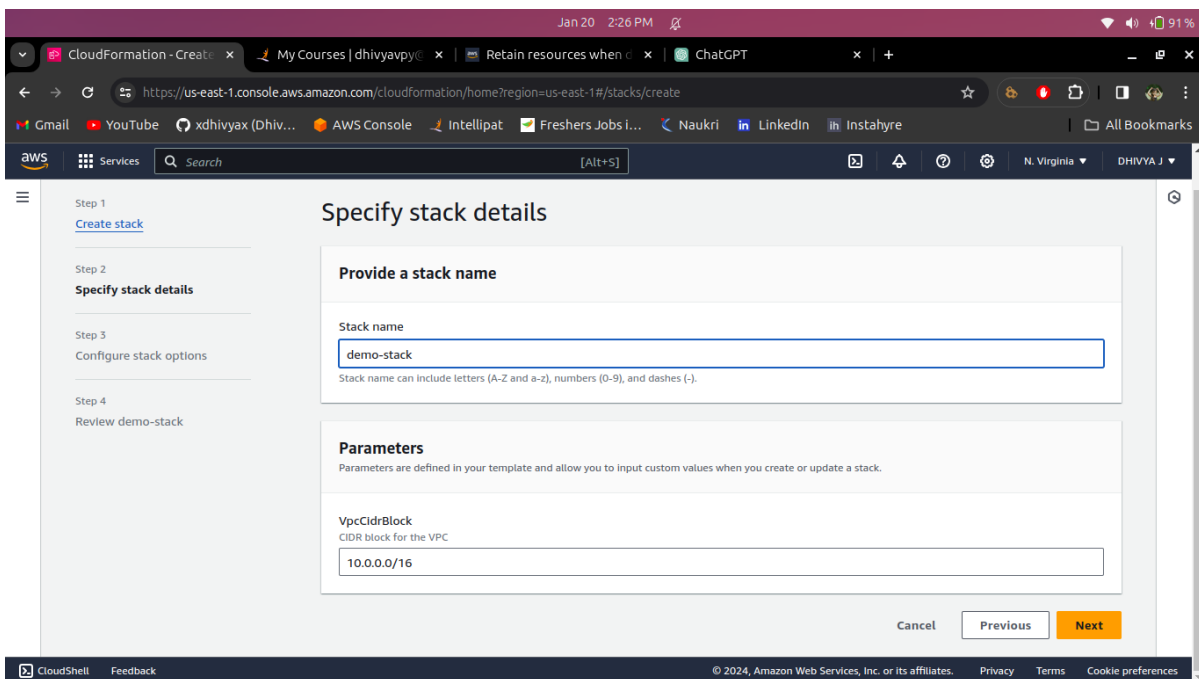
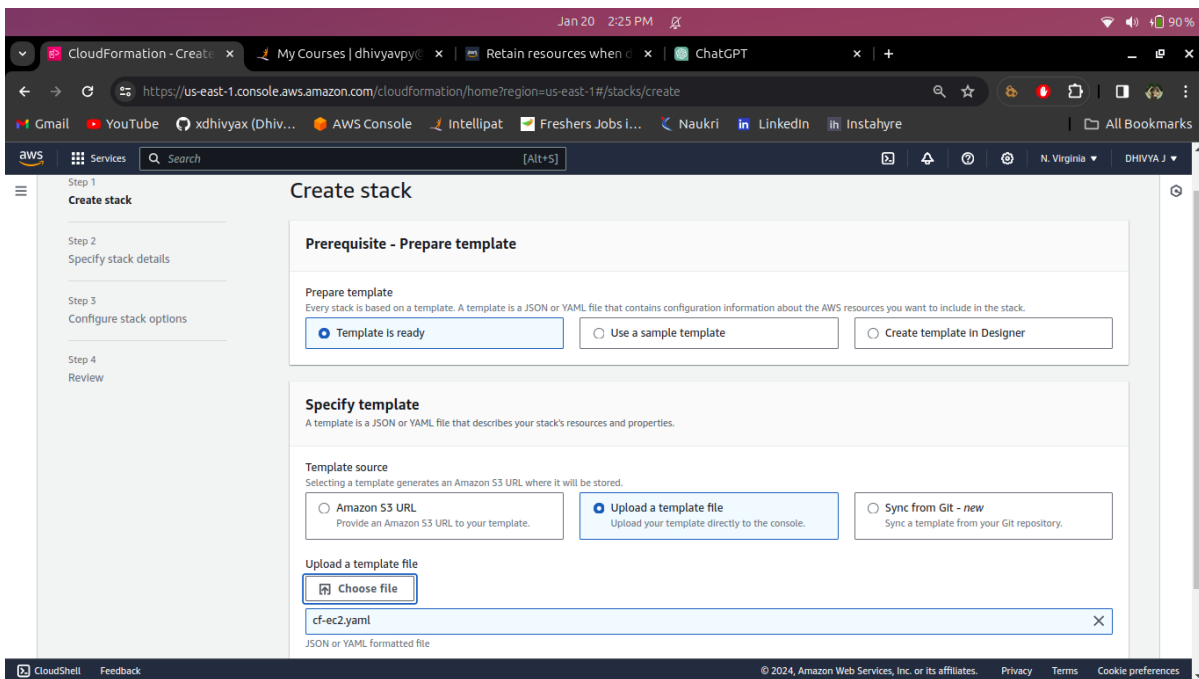
You work for XYZ Corporation. Your corporation wants to launch a new web-based application. The development team has prepared the code but it is not tested yet. The development team needs the system admins to build a web server to test the code but the system admins are not available.

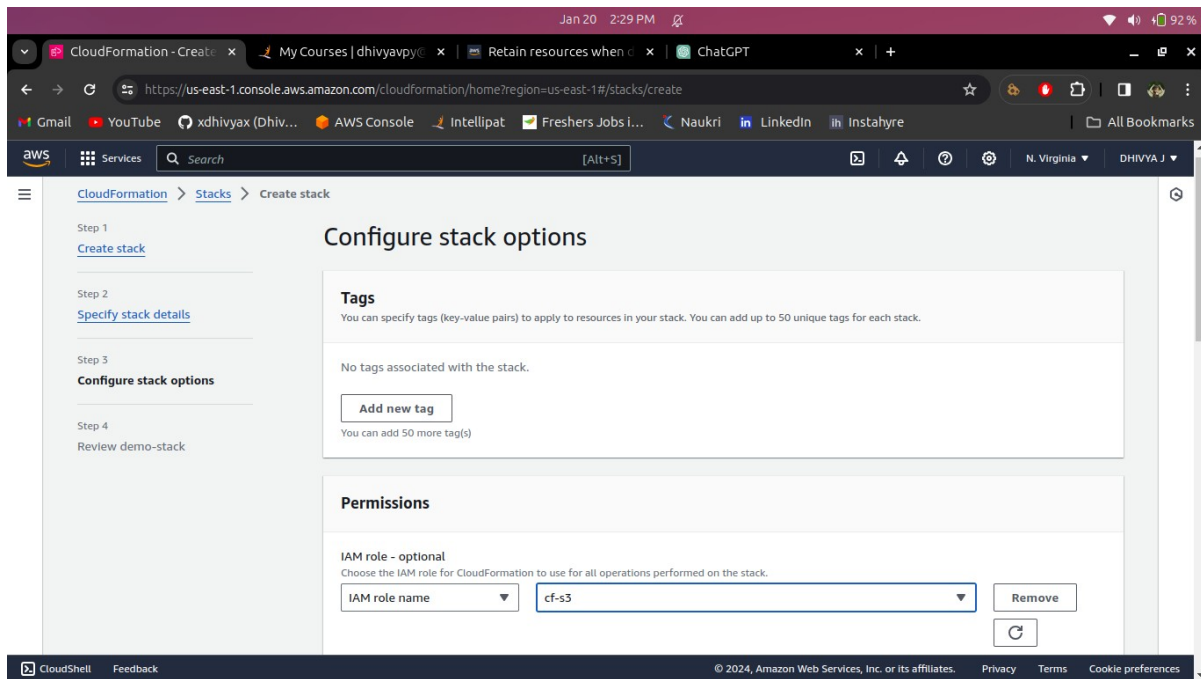
## Tasks To Be Performed:

1. Web tier: Launch an instance in a public subnet and that instance should allow HTTP and SSH from the internet.
2. Application tier: Launch an instance in a private subnet of the web tier and it should allow only SSH from the public subnet of Web Tier-3.
3. DB tier: Launch an RDS MYSQL instance in a private subnet and it should allow connection on port 3306 only from the private subnet of Application Tier-4.
4. Setup a Route 53 hosted zone and direct traffic to the EC2 instance.

You have been also asked to propose a solution so that:

1. Development team can test their code without having to involve the system admins and can invest their time in testing the code rather than provisioning, configuring and updating the resources needed to test the code.
2. Make sure when the development team deletes the stack, RDS DB instances should not be deleted.





CloudFormation - Stack > demo-stack

demo-stack

Stacks Delete Update Stack actions Create stack

Stack info Events Resources Outputs Parameters Template Change sets Git sync - new

Events (48)

Search events

Detect root cause

Timestamp	Logical ID	Status	Status reason
2024-01-20 14:30:28 UTC+0530	AppTierInstance	CREATE_COMPLETE	-
2024-01-20 14:30:22 UTC+0530	WebTierInstance	CREATE_COMPLETE	-
2024-01-20 14:30:01 UTC+0530	WebTierRoute	CREATE_COMPLETE	-
2024-01-20 14:29:56 UTC+0530	WebTierPublicSubnetAssociation	CREATE_COMPLETE	-
2024-01-20 14:29:56 UTC+0530	AppTierInstance	CREATE_IN_PROGRESS	Resource creation initiated

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CloudFormation - Stack > demo-stack

demo-stack

Stacks Delete Update Stack actions Create stack

Stack info Events Resources Outputs Parameters Template Change sets Git sync - new

Resources (16)

Search resources

Logical ID	Physical ID	Type	Status	Module
RDSecurityGroupIngress	RDSecurityGroupIngress	AWS::EC2::SecurityGroupIngress	CREATE_COMPLETE	-
WebTierInstance	<a href="#">i-097240c27c0a5a7fd</a>	AWS::EC2::Instance	CREATE_COMPLETE	-
WebTierPublicSubnet	<a href="#">subnet-017b1046a4aef8c6c</a>	AWS::EC2::Subnet	CREATE_COMPLETE	-
WebTierPublicSubnetAssociation	rtbassoc-0a768a98c0c69fae9	AWS::EC2::SubnetRouteTableAssociation	CREATE_COMPLETE	-
WebTierRoute	rtb-04e9fc8ba3035474d0.0.0.0/0	AWS::EC2::Route	CREATE_COMPLETE	-
WebTierRouteTable	rtb-04e9fc8ba3035474d	AWS::EC2::RouteTable	CREATE_COMPLETE	-
WebTierSecurityGroup	<a href="#">sg-04adc0fa3cc24ccfd</a>	AWS::EC2::SecurityGroup	CREATE_COMPLETE	-

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https://us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#vpcs:

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VPC dashboard x

EC2 Global View

Filter by VPC: Select a VPC

Virtual private cloud

Your VPCs

Subnets

Route tables

Internet gateways

Egress-only internet gateways

Carrier gateways

DHCP option sets

Elastic IPs

Managed prefix lists

Endpoints

Endpoint services

Your VPCs (2) Info

Search

<input type="checkbox"/>	Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR
<input type="checkbox"/>	MyVPC	vpc-0fc68688a2e5cc28a	Available	10.0.0.0/16	-

Select a VPC above

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Elastic IPs

Managed prefix lists

Endpoints

Endpoint services

Subnets (2) Info

Find resources by attribute or tag

vpc-0fc68688a2e5cc28a Clear filters

<input type="checkbox"/>	Name	Subnet ID	State	VPC
<input type="checkbox"/>	AppTierPrivateSubnet	subnet-04adb129629414327	Available	vpc-0fc68688a2e5cc28a
<input type="checkbox"/>	WebTierPublicSubnet	subnet-017b1046a4aef8c6c	Available	vpc-0fc68688a2e5cc28a

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https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#instancessearch=runningv=3;\$case=tags: true%5C,client: false;\$regex=ta...

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EC2 Dashboard EC2 Global View Events Console-to-Code Preview

Instances

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Capacity Reservations

New

Images

AMIs

AMI Catalog

Instances (2) Info

Find Instance by attribute or tag (case-sensitive)

running X Clear filters

<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Avail...
<input type="checkbox"/>		i-0a881147dd937a8a0	Running	t2.micro	2/2 checks passed	View alarms +	us-
<input type="checkbox"/>		i-097240c27c0a5a7fd	Running	t2.micro	2/2 checks passed	View alarms +	us-

Select an instance

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running X Clear filters

<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Avail...
<input type="checkbox"/>		i-0a881147dd937a8a0	Running	t2.micro	2/2 checks passed	View alarms +	us-
<input checked="" type="checkbox"/>		i-097240c27c0a5a7fd	Running	t2.micro	2/2 checks passed	View alarms +	us-

Instance: i-097240c27c0a5a7fd

Auto-assigned IP address 44.223.16.154 [Public IP]	VPC ID vpc-0fc68688a2e5cc28a (MyVPC)	AWS Compute Optimizer finding Opt-in to AWS Compute Optimizer for recommendations. Learn more
IAM Role -	Subnet ID subnet-017b1046a4aef8c6c (WebTierPublicSubnet)	Auto Scaling Group name -
IMDSv2 Optional		

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EC2 Dashboard x

EC2 Global View

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Instances (1/2) Info

Find instance by attribute or tag (case-sensitive)

running X Clear filters

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	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Avi
<input type="checkbox"/>		i-0a881147dd937a8a0	Running	t2.micro	2/2 checks passed	View alarms +	us-
<input checked="" type="checkbox"/>		i-097240c27c0a5a7fd	Running	t2.micro	2/2 checks passed	View alarms +	us-

Instance: i-097240c27c0a5a7fd

Security groups

sg-04adc0fa3cc24ccfd (demo-stack-WebTierSecurityGroup-DBSL2CO886Y7)

▼ Inbound rules

Filter rules

< 1 >

Name	Security group rule ID	Port range	Protocol	Source
------	------------------------	------------	----------	--------

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EC2 > Security Groups > sg-04adc0fa3cc24ccfd - demo-stack-WebTierSecurityGroup-DBSL2CO886Y7 > Edit inbound rules

Edit inbound rules Info

Inbound rules control the incoming traffic that's allowed to reach the instance.

Inbound rules Info

Security group rule ID	Type Info	Protocol Info	Port range	Source Info	Description - optional Info
sg-0e45e54c6054b88c6	SSH	TCP	22	Cus... 0.0.0.0/0 X	Delet e
sg-0a53a30931f398dc0	HTTP	TCP	80	Cus... 0.0.0.0/0 X	Delet e

Add rule

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Instances (1/2) Info

Find Instance by attribute or tag (case-sensitive)

running X Clear filters

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Av
<input checked="" type="checkbox"/>		i-0a881147dd937a8a0	Running	t2.micro	2/2 checks passed	View alarms +	us-
<input type="checkbox"/>		i-097240c27c0a5a7fd	Running	t2.micro	2/2 checks passed	View alarms +	us-

Instance: i-0a881147dd937a8a0

Auto-assigned IP address -

VPC ID vpc-0fc68688a2e5cc28a (MyVPC)

AWS Compute Optimizer finding

Opt-in to AWS Compute Optimizer for recommendations.

Learn more

IAM Role -

Subnet ID subnet-04adb129629414327 (AppTierPrivateSubnet)

Auto Scaling Group name -

IMDSv2

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Instances (1/2) Info

Find Instance by attribute or tag (case-sensitive)

running X Clear filters

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Av
<input checked="" type="checkbox"/>		i-0a881147dd937a8a0	Running	t2.micro	2/2 checks passed	View alarms +	us-
<input type="checkbox"/>		i-097240c27c0a5a7fd	Running	t2.micro	2/2 checks passed	View alarms +	us-

Instance: i-0a881147dd937a8a0

Standard Time)

Security groups

sg-02126600582577a15 (demo-stack-AppTierSecurityGroup-1FKQWYJ7ZW7WB)

▼ Inbound rules

Filter rules

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EC2 > Security Groups > sg-02126600582577a15 - demo-stack-AppTierSecurityGroup-1FKQWYJ7ZW7WB > Edit inbound rules

### Edit inbound rules Info

Inbound rules control the incoming traffic that's allowed to reach the instance.

#### Inbound rules Info

Security group rule ID	Type <small>Info</small>	Protocol <small>Info</small>	Port range <small>Info</small>	Source <small>Info</small>	Description - optional <small>Info</small>	
sg-0157ce8364111d0f4	SSH	TCP	22	Cus... <input type="text" value="sg-04adc0fa3cc24ccfd"/>	<input type="text"/>	Delete
<div>Add rule</div>						

Cancel Preview changes Save rules

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https://us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#databases: ☆

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Amazon RDS x

Dashboard

Databases

Query Editor

Performance Insights

Snapshots

Exports in Amazon S3

Automated backups

Reserved instances

Proxies

Subnet groups

Parameter groups

Option groups

Custom engine versions

Zero-ETL integrations New

RDS > Databases

Databases (1) ☒ Group resources

<input type="checkbox"/>	DB identifier ▲	Status ▼	Role ▼	Engine ▼	Region & AZ ▼	Size ▼	Recommendat
<input type="radio"/>	<a href="#">mydbinstance</a>	Available	Instance	MySQL Community	us-east-1b	db.t2.micro	

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https://us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#database:id=mydbinstance;js-cluster=false

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### Amazon RDS

- Dashboard
- Databases
- Query Editor
- Performance Insights
- Snapshots
- Exports in Amazon S3
- Automated backups
- Reserved Instances
- Proxies
- Subnet groups
- Parameter groups
- Option groups
- Custom engine versions
- Zero-ETL Integrations **New**

## mydbinstance

Summary

DB identifier mydbinstance	Status Available	Role Instance	Engine MySQL Community	Recommendations
CPU 6.50%	Class db.t2.micro	Current activity 0	Region & AZ us-east-1b	

Connectivity & security Monitoring Logs & events Configuration Zero-ETL integrations Maintenance &

### Connectivity & security

Endpoint & port Networking Security

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https://us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#database-id=mydbinstance&is-cluster=false

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### Amazon RDS

- Dashboard
- Databases**
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- Subnet groups
- Parameter groups
- Option groups
- Custom engine versions
- Zero-ETL integrations **New**

### Connectivity & security

Endpoint & port	Networking	Security
Endpoint mydbinstance.cakvj97ke5vr.us-east-1.rds.amazonaws.com	Availability Zone us-east-1b	VPC security groups demo-stack-RDS5SecurityGroup-1LQ3EGZCJDA0E (sg-0ff66ab1942bbc9a0) <b>Active</b>
Port 3306	VPC MyVPC (vpc-0fc68688a2e5cc28a)	Publicly accessible No
	Subnet group mydbsubnetgroup	Certificate authority <a href="#">Info</a> rds-ca-2019
	Subnets subnet-017b1046a4aef8c6c subnet-04adb129629414327	Certificate authority date August 22, 2024, 22:38 (UTC+05:30)
	Network type IPv4	DB instance certificate

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https://us-east-1.console.aws.amazon.com/ec2/v2/home?region=us-east-1#ModifyInboundSecurityGroupRules:securityGroupId=sg-0ff66ab1942bbc9a0

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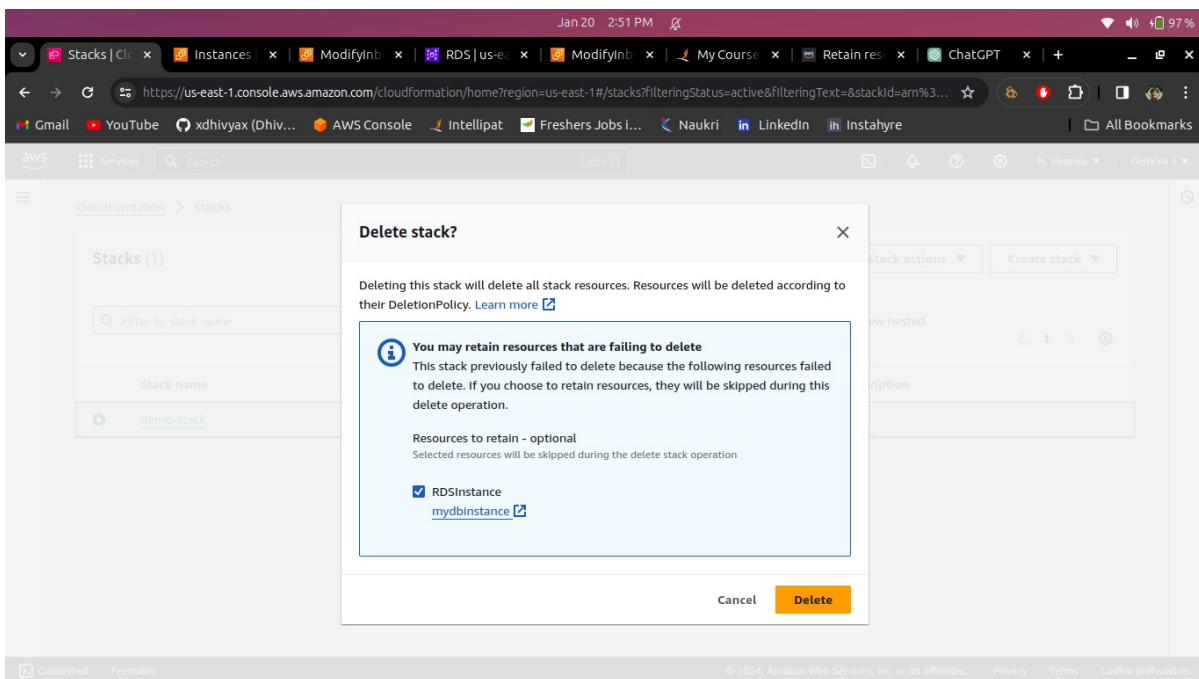
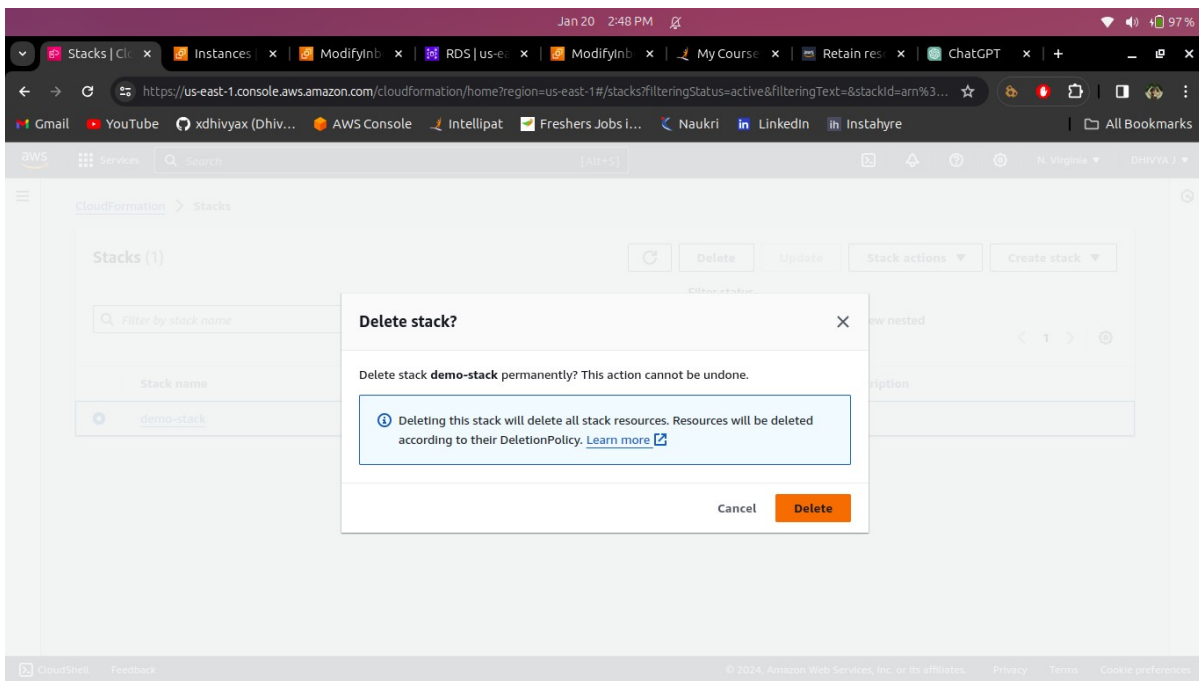
EC2 > Security Groups > sg-0ff66ab1942bbc9a0 - demo-stack-RDS5SecurityGroup-1LQ3EGZCJDA0E > Edit inbound rules

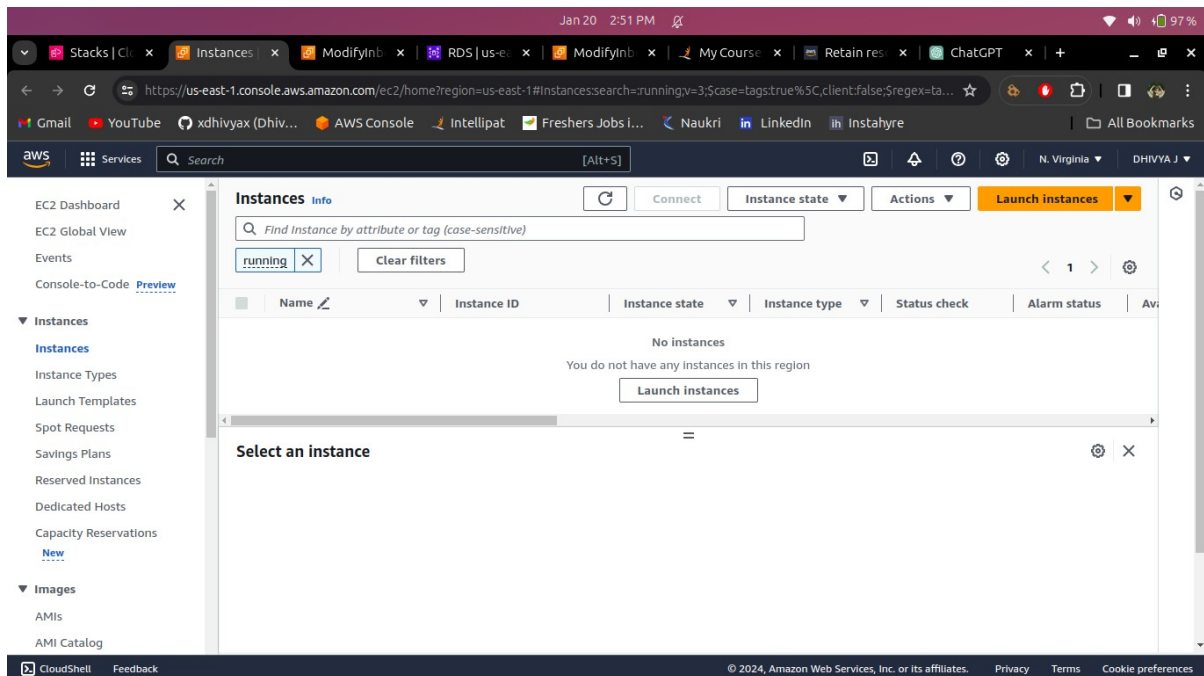
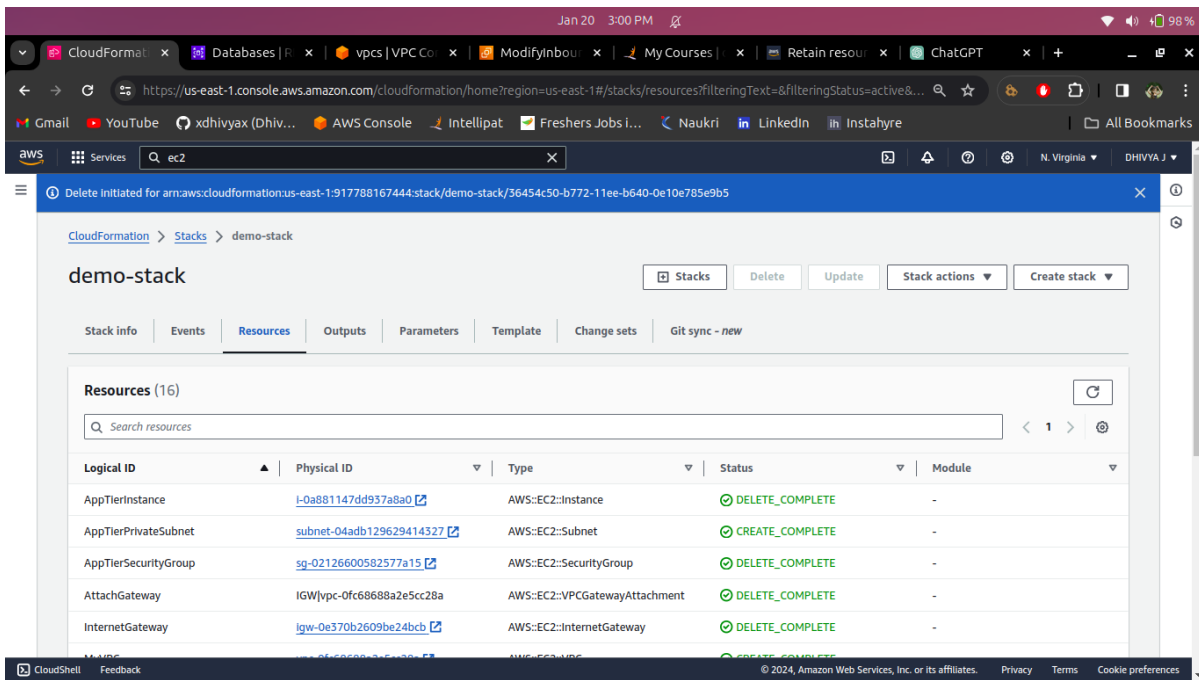
### Edit inbound rules [Info](#)

Inbound rules control the incoming traffic that's allowed to reach the instance.

Security group rule ID	Type <a href="#">Info</a>	Protocol <a href="#">Info</a>	Port range <a href="#">Info</a>	Source <a href="#">Info</a>	Description - optional <a href="#">Info</a>
sg-0b10428b2f7a97c8a	MYSQL/Aurora	TCP	3306	Cus... <input type="text" value="Q"/>	<input type="text" value="Delete"/>

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**Amazon RDS**

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Snapshots  
Exports in Amazon S3  
Automated backups  
Reserved instances  
Proxies

Subnet groups  
Parameter groups  
Option groups  
Custom engine versions  
Zero-ETL Integrations [New](#)

Events

**Databases (1)** Group resources Modify Actions Restore from S3 Create database

Filter by databases

	DB identifier ▲	Status ▼	Role ▼	Engine ▼	Region & AZ ▼	Size ▼	Recommendations ▼	CPU
	<a href="#">mydbinstance</a>	Available	Instance	MySQL Community	us-east-1b	db.t2.micro		

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