

# Production-Grade Highly Available Web Application Architecture on AWS

## Project Summary

This project implements a production-grade, highly available, and secure web application architecture using AWS best practices. The system is deployed across multiple Availability Zones to ensure fault tolerance and continuous operation under varying load conditions. Users access the application through Amazon CloudFront, which provides global caching and performance optimization. CloudFront routes traffic to an Application Load Balancer in public subnets, which distributes requests to a private Auto Scaling Group (ASG) of EC2 instances configured through launch templates and automated user-data provisioning.

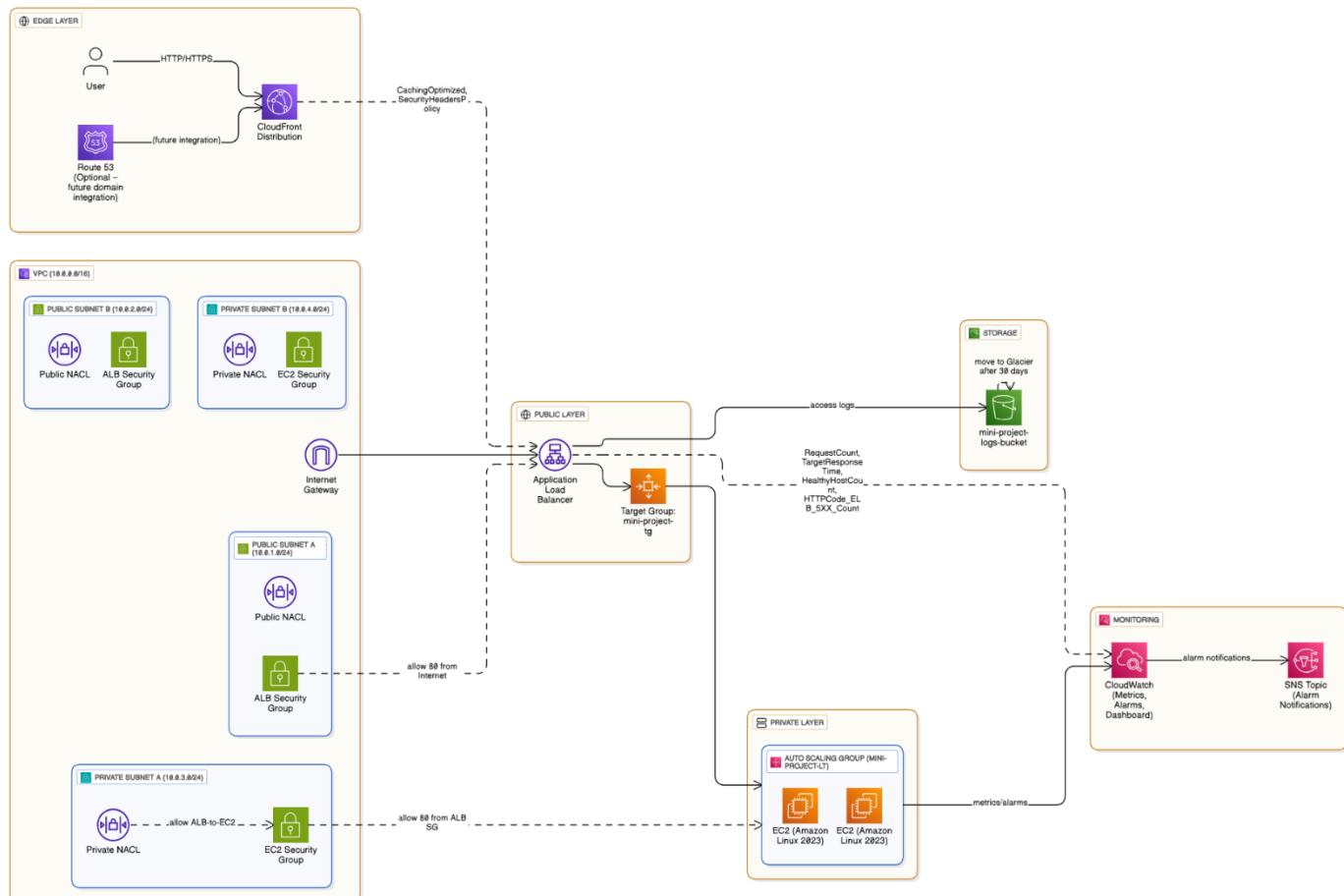
The architecture enforces strong security controls using segmented VPC subnets, security groups, and Network ACLs to isolate traffic flows between the edge, public, and private layers. Centralized logging is handled through an S3 logging bucket with lifecycle policies, and full observability is provided through Amazon CloudWatch dashboards, metrics, and alarms, with automated notifications via SNS.

This deployment mirrors real-world enterprise infrastructure and demonstrates expertise in high availability, load balancing, auto scaling, secure network design, observability, and AWS cloud architecture.

## Architecture Diagram

### Description:

The following diagram illustrates the complete production-grade architecture including CloudFront, ALB, Auto Scaling Group, multi-AZ VPC design, security layers, logging, and monitoring components.



### **3. AWS Services Utilized**

List them clearly:

- Amazon VPC
- Public & Private Subnets
- Internet Gateway
- Route Tables
- Network ACLs
- Security Groups
- Application Load Balancer
- Target Group
- EC2 Launch Template
- Auto Scaling Group
- Amazon CloudFront
- Amazon S3 (logging bucket)
- Amazon CloudWatch (dashboards, alarms, metrics)
- Amazon SNS (notifications)
- IAM Roles & Instance Profiles

### **4. Key Architecture Features**

- Multi-AZ high availability
- Secure network segmentation (public/private subnets)
- Auto scaling based on CPU utilization
- Global content delivery with CloudFront
- Centralized ALB access logging in S3
- Cost-optimized log storage with lifecycle rules
- Health checks for automated failover and recovery
- CloudWatch dashboards and alarms for observability
- SNS email notifications for operational events

### **5. Implementation Overview**

1. Created VPC and subnets across two Availability Zones
2. Configured route tables and attached Internet Gateway
3. Implemented NACLs and Security Groups
4. Deployed Application Load Balancer in public subnets
5. Created Launch Template with user-data to install Apache
6. Deployed Auto Scaling Group in private subnets
7. Configured CPU-based scaling policies
8. Enabled ALB access logging to S3
9. Created S3 lifecycle rule (transition logs to Glacier after 30 days)
10. Configured CloudFront distribution using ALB as origin
11. Built CloudWatch dashboard and alarms
12. Integrated SNS for alert notifications
13. Tested CloudFront and ALB endpoints

## 6. Monitoring and Logging

### Monitoring (CloudWatch):

- CPU utilization
- RequestCount
- 5XX errors
- TargetResponseTime
- HealthyHostCount

### Alarms:

- High CPU
- Low CPU
- ALB 5XX errors

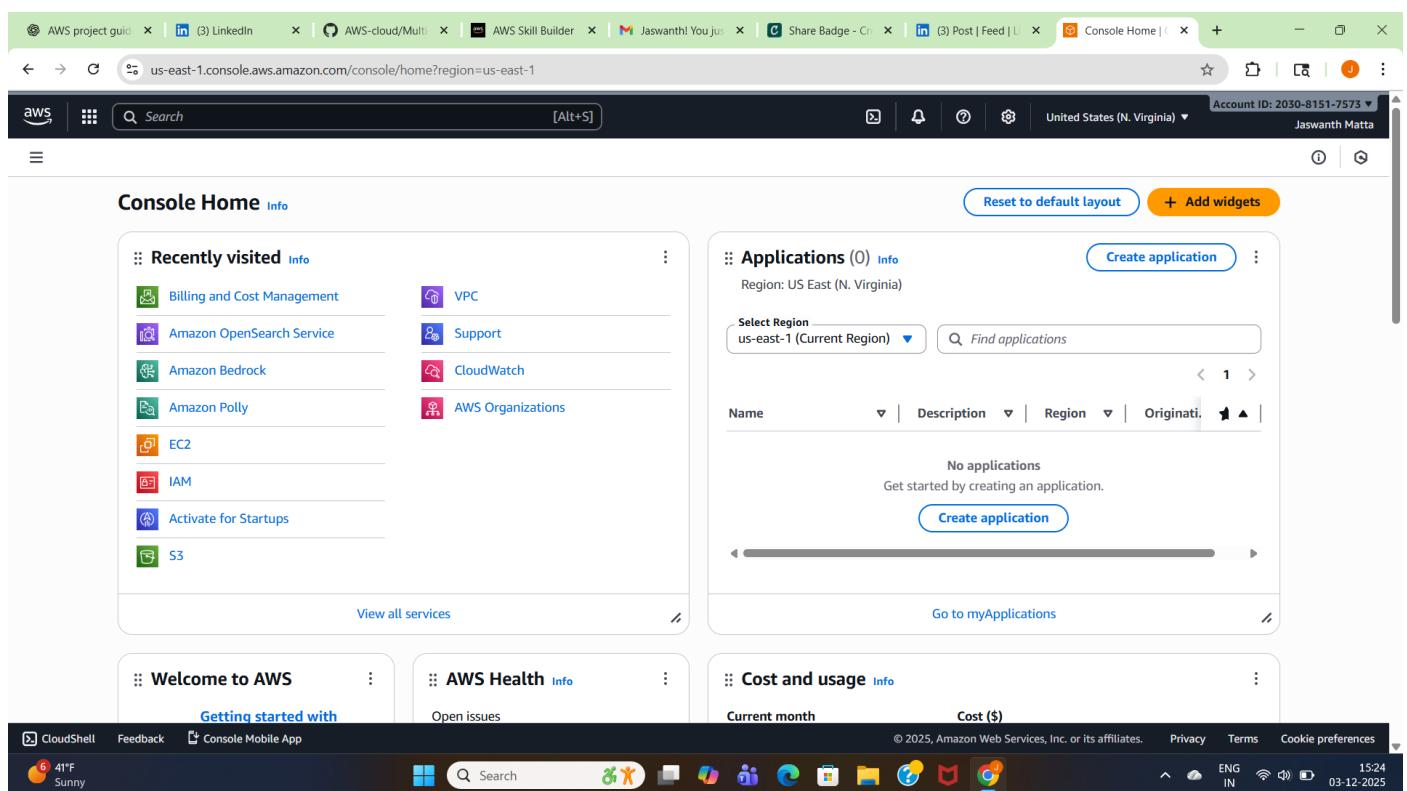
### Notifications:

- SNS email alerts

### Logging:

- ALB access logs stored in S3
- Lifecycle rule transitions logs to Glacier after 30 days

## 7. Implementation Screenshots



Screenshot of the AWS IAM Users page showing two users: customer\_service\_agent and smart-service-agent.

**Users (2) Info**

An IAM user is an identity with long-term credentials that is used to interact with AWS in an account.

User name	Path	Group	Last activity	MFA	Password age	Console last sign-in	Access key last used
customer_service_agent	/	1	20 days ago	-	20 days	20 days ago	-
smart-service-agent	/	1	16 days ago	-	21 days	16 days ago	-

**Actions**

- 
- 

**Navigation**

- Search IAM
- Dashboard
- Access management
  - User groups
  - Users**
  - Roles
  - Policies
  - Identity providers
  - Account settings
  - Root access management
  - Temporary delegation requests
  - New
- Access reports
  - Access Analyzer
  - Resource analysis New
  - Unused access

**Bottom Bar**

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A dedicated IAM user (Jaswanth\_mini\_project) was created to handle all project-related AWS operations. This aligns with AWS best practices by isolating project access from the root account and enabling controlled permissions for secure resource management.

Screenshot of the AWS IAM Create user page, Step 1: Specify user details.

**Step 1**

**Specify user details**

**User details**

**User name**: Jaswanth\_mini\_project

The user name can have up to 64 characters. Valid characters: A-Z, a-z, 0-9, and + = , . \_ - (hyphen)

**Provide user access to the AWS Management Console - optional**  
In addition to console access, users with SignInLocalDevelopmentAccess permissions can use the same console credentials for programmatic access without the need for access keys.

**Console password**

Autogenerated password  
You can view the password after you create the user.

Custom password  
Enter a custom password for the user.  
\*\*\*\*\*

Must be at least 8 characters long  
Must include at least three of the following mix of character types: uppercase letters (A-Z), lowercase letters (a-z), numbers (0-9), and symbols ! @ # \$ % ^ & \* ( ) \_ + - (hyphen) = [ ] { } |

**Show password**

**Users must create a new password at next sign-in - Recommended**  
Users automatically get the IAMUserChangePassword policy to allow them to change their own password.

If you are creating programmatic access through access keys or service-specific credentials for AWS CodeCommit or Amazon Kinesis, you can generate them after you create the user.

**Actions**

**Navigation**

- Step 1
- Step 2  Set permissions
- Step 3  Review and create
- Step 4  Retrieve password

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AWS project guid | LinkedIn | AWS-cloud/Multi | AWS Skill Builder | Jaswanth! You just | Share Badge - Cr | (3) Post | Feed | Create user | IAM | Global | Account ID: 2030-8151-5753 | Jaswanth Matta

us-east-1.console.aws.amazon.com/iam/home?region=us-east-1#/users/create

Search [Alt+S] Global

IAM > Users > Create user

mini\_project user group created.

Step 1 Specify user details  
Step 2 Set permissions  
Step 3 Review and create  
Step 4 Retrieve password

**Set permissions**  
Add user to an existing group or create a new one. Using groups is a best-practice way to manage user's permissions by job functions. [Learn more](#)

**Permissions options**

Add user to group  
Add user to an existing group, or create a new group. We recommend using groups to manage user permissions by job function.

Copy permissions  
Copy all group memberships, attached managed policies, and inline policies from an existing user.

Attach policies directly  
Attach a managed policy directly to a user. As a best practice, we recommend attaching policies to a group instead. Then, add the user to the appropriate group.

**User groups (1/2)**

Group name	Users	Attached policies	Created
AI_agent	2	AmazonS3FullAccess, AmazonTran...	2025-11-11 (22 days ago)
mini_project	0	AdministratorAccess	2025-12-03 (Now)

[Create group](#)

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us-east-1.console.aws.amazon.com/iam/home?region=us-east-1#/users

Search [Alt+S] Global

IAM > Users

**Identity and Access Management (IAM)**

Search IAM

**Users (3) Info**  
An IAM user is an identity with long-term credentials that is used to interact with AWS in an account.

**User created successfully**  
You can view and download the user's password and email instructions for signing in to the AWS Management Console.  
[View user](#)

User name	Path	Groups	Last activity	MFA	Password age	Console last sign-in	Access
customer_service_agent	/	1	20 days ago	-	20 days	20 days ago	-
Jaswanth_mini_project	/	1	-	-	Now	-	-
smart-service-agent	/	1	16 days ago	-	21 days	16 days ago	-

[Create user](#)

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A new VPC named **mini-project-vpc** was created using the CIDR block **10.0.0.0/16**, providing the network foundation for all public and private subnets in the project.

Screenshot of the AWS VPC creation process:

**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 - optional**  
Creates a tag with a key of 'Name' and a value that you specify.  
mini-project-vpc

**IPv4 CIDR block** [Info](#)  
 IPv4 CIDR manual input     IPAM-allocated IPv4 CIDR block  
10.0.0.0/16

CIDR block size must be between /16 and /28.

**IPv6 CIDR block** [Info](#)  
 No IPv6 CIDR block  
 IPAM-allocated IPv6 CIDR block  
 Amazon-provided IPv6 CIDR block  
 IPv6 CIDR owned by me

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Screenshot of the AWS VPC dashboard showing the newly created VPC:

**Your VPCs** (1/2) [Info](#)

You successfully created **mini-project-vpc** / mini-project-vpc

Name	VPC ID	State	Encryption c...	Encryption control ...	Block Public...	IPV4
-	vpc-07fe485a707516e6b	Available	-	-	Off	172
<input checked="" type="checkbox"/> mini-project-vpc	vpc-0c32270a23e57f69c	Available	-	-	Off	10.0

**Details** [Resource map](#) [CIDRs](#) [Flow logs](#) [Tags](#) [Integrations](#)

**Details**

VPC ID vpc-0c32270a23e57f69c	State Available	Block Public Access Off	DNS hostnames Disabled
DNS resolution Enabled	Tenancy default	DHCP option set dopt-04dbfabd5ad2e3867	Main route table -
Default VPC		IPv4 CIDR	IPv6 CIDR

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## Subnet Creation

Public and private subnets were created across two Availability Zones using /24 CIDR blocks, enabling separation of external-facing resources (ALB) from internal compute resources (EC2 Auto Scaling Group).

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateSubnet:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Subnets > Create subnet

### Create subnet Info

**VPC**

**VPC ID**  
Create subnets in this VPC.  
vpc-0c32270a23e57f69c (mini-project-vpc)

**Associated VPC CIDRs**

**IPv4 CIDRs**  
10.0.0.0/16

**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.  
public-myproject-01  
The name can be up to 256 characters long.

**Availability Zone Info**

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateSubnet:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Subnets > Create subnet

**Availability Zone Info**  
Choose the zone in which your subnet will reside, or let Amazon choose one for you.  
United States (N. Virginia) / use1-az1 (us-east-1a)

**IPv4 VPC CIDR block Info**  
Choose the VPC's IPv4 CIDR block for the subnet. The subnet's IPv4 CIDR must lie within this block.  
10.0.0.0/16

**IPv4 subnet CIDR block**  
10.0.1.0/24 256 IPs

**Tags - optional**

Key Value - optional  
Name public-myproject-01  
Add new tag Remove  
You can add 49 more tags.  
Remove Add new subnet

Cancel Create subnet

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20308151753-a4etx75ls-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#subnets:subnetId=subnet-034f5b731fcdbbb5a

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Subnets

You have successfully created 1 subnet: subnet-034f5b731fcdbbb5a

Last updated less than a minute ago Actions Create subnet

Subnets (1) Info

Find subnets by attribute or tag

Subnet ID : subnet-034f5b731fcdbbb5a Clear filters

Name	Subnet ID	State	VPC	Block Public...	IPv4 CIDR
public-myproject-01	subnet-034f5b731fcdbbb5a	Available	vpc-0c32270a23e57f69c   mini...	Off	10.0.1.0/24

Select a subnet

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20308151753-a4etx75ls-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#createSubnet:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Subnets > Create subnet

**Availability Zone** Info

Choose the zone in which your subnet will reside, or let Amazon choose one for you.

United States (N. Virginia) / use1-az1 (us-east-1a)

**IPv4 VPC CIDR block** Info

Choose the VPC's IPv4 CIDR block for the subnet. The subnet's IPv4 CIDR must lie within this block.

10.0.0.0/16

**IPv4 subnet CIDR block**

10.0.3.0/24 256 IPs

**Tags - optional**

Key Value - optional

Name private-myproject-01 Remove

Add new tag

You can add 49 more tags.

Remove Add new subnet

Cancel Create subnet

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20308151753-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#subnets:subnetId=subnet-04beade7f37b864e

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Subnets

You have successfully created 1 subnet: subnet-04beade7f37b864e

Last updated less than a minute ago

Subnets (1) Info Actions Create subnet

Find subnets by attribute or tag

Subnet ID : subnet-04beade7f37b864e Clear filters

Name	Subnet ID	State	VPC	Block Public...	IPv4 CIDR
private-myproject-01	subnet-04beade7f37b864e	Available	vpc-0c32270a23e57f69c   mini...	Off	10.0.3.0/24

Select a subnet

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20308151753-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateSubnet:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Subnets > Create subnet

public-myproject-02

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.

United States (N. Virginia) / use1-az2 (us-east-1b)

IPv4 VPC CIDR block Info

Choose the VPC's IPv4 CIDR block for the subnet. The subnet's IPv4 CIDR must lie within this block.

10.0.0.0/16

IPv4 subnet CIDR block

10.0.2.0/24 256 IPs

Tags - optional

Key Name Value - optional public-myproject-02

Add new tag You can add 49 more tags.

Remove Add new subnet

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Breaking news Pentagons watch... ENG IN 16:01 03-12-2025

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20308151753-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateSubnet:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Subnets > Create subnet

**Availability Zone** Info  
Choose the zone in which your subnet will reside, or let Amazon choose one for you.  
United States (N. Virginia) / use1-az2 (us-east-1b)

**IPv4 VPC CIDR block** Info  
Choose the VPC's IPv4 CIDR block for the subnet. The subnet's IPv4 CIDR must lie within this block.  
10.0.0.0/16

**IPv4 subnet CIDR block**  
10.0.4.0/24 256 IPs

**Tags - optional**  
Key Value - optional  
Name private-myproject-02 Add new tag Remove  
You can add 49 more tags. Remove

Add new subnet

Create subnet

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Sunset 4:29 PM ENG IN 16:02 03-12-2025

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20308151753-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#subnets:subnetId=subnet-09f8c62830bc40ab9

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Subnets

Your VPCs

**Subnets**

- Route tables
- Internet gateways
- Egress-only internet gateways
- Carrier gateways
- DHCP option sets
- Elastic IPs
- Managed prefix lists
- NAT gateways
- Peering connections
- Route servers

**Security**

- Network ACLs
- Security groups

**PrivateLink and Lattice**

- Getting started
- Endpoints
- Endpoint services
- Service networks

**Subnets (1) Info**

You have successfully created 1 subnet: subnet-09f8c62830bc40ab9

Last updated less than a minute ago

Create subnet

Name	Subnet ID	State	VPC	Block Public...	IPv4 CIDR
private-myproject-02	subnet-09f8c62830bc40ab9	Available	vpc-0c32270a23e57f69c   mini...	Off	10.0.4.0/24

**Select a subnet**

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The screenshot shows the AWS VPC Subnets page. On the left, there's a sidebar with links like 'Your VPCs', 'Subnets' (which is selected), 'Route tables', 'Internet gateways', 'Egress-only internet gateways', 'Carrier gateways', 'DHCP option sets', 'Elastic IPs', 'Managed prefix lists', 'NAT gateways', 'Peering connections', 'Route servers', 'Security' (with Network ACLs and Security groups), 'PrivateLink and Lattice' (with Getting started, Endpoints, Endpoint services, and Service networks), and 'CloudShell', 'Feedback', and 'Console Mobile App'. The main area has a title 'Subnets (10) Info' and a search bar 'Find subnets by attribute or tag'. A table lists 10 subnets:

Name	Subnet ID	State	VPC	Block Public...	IPv4 CIDR
-	subnet-01eab526670aff625	Available	vpc-07fe485a707516e6b	Off	172.31.16.0/2
-	subnet-02d156026671e0ce8	Available	vpc-07fe485a707516e6b	Off	172.31.64.0/2
-	subnet-01540efd45a587f73	Available	vpc-07fe485a707516e6b	Off	172.31.32.0/2
-	subnet-0427682dc7c57de4d	Available	vpc-07fe485a707516e6b	Off	172.31.0.0/20
-	subnet-047584a114ce3079f	Available	vpc-07fe485a707516e6b	Off	172.31.80.0/2
public-myproject-01	subnet-034f5b731fcdbbb5a	Available	vpc-0c32270a23e57f69c   mini...	Off	10.0.1.0/24
private-myproject-01	subnet-04beaadef73fb864e	Available	vpc-0c32270a23e57f69c   mini...	Off	10.0.3.0/24
public-myproject-02	subnet-0a5130f3f4dc219be	Available	vpc-0c32270a23e57f69c   mini...	Off	10.0.2.0/24
private-myproject-02	subnet-09f8c62830bc40ab9	Available	vpc-0c32270a23e57f69c   mini...	Off	10.0.4.0/24

Below the table, a section titled 'Select a subnet' is shown.

## Internet Gateway Creation

An Internet Gateway (mini-project-igw) was created and attached to the VPC to provide internet connectivity for public subnets.

The screenshot shows the 'Create internet gateway' page. At the top, it says 'Create internet gateway Info'. Below that, a note states: '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.' The main form has a section 'Internet gateway settings' with a 'Name tag' field containing 'mini-project-igw'. There's also a 'Tags - optional' section with a key-value pair 'Name' and 'mini-project-igw'. At the bottom right are 'Cancel' and 'Create internet gateway' buttons.

The screenshot shows the Windows taskbar at the bottom of the screen. It includes icons for CloudShell, Feedback, Console Mobile App, File Explorer, a search bar, and various pinned applications like Microsoft Edge, File Explorer, and Task View. System status icons for battery, signal, and time (22:51, 03-12-2025) are also visible.

The screenshot shows the AWS VPC Internet Gateways page. A success message at the top states: "The following internet gateway was created: igw-030514beb936c8215 - mini-project-igw. You can now attach to a VPC to enable the VPC to communicate with the internet." Below this, the internet gateway is listed with the ID "igw-030514beb936c8215 / mini-project-igw". The "Details" section shows the Internet gateway ID, State (Detached), VPC ID (empty), and Owner (203081517573). The "Tags (1)" section contains a single tag named "Name" with the value "mini-project-igw".

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203081517573-a4etx75l.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#AttachInternetGateway:internetGatewayId=igw-030514beb936c8215

warn Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_miniproject

VPC > Internet gateways > Attach to VPC (igw-030514beb936c8215)

## Attach to VPC (igw-030514beb936c8215) Info

**VPC**  
Attach an internet gateway to a VPC to enable the VPC to communicate with the internet. Specify the VPC to attach below.

**Available VPCs**  
Attach the internet gateway to this VPC.

vpc-0c32270a23e57f69c

▶ AWS Command Line Interface command

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aws | Search | [Alt+S] | Actions ▾

VPC > Internet gateways > igw-030514beb936c8215

**VPC dashboard**

AWS Global View ▾

Filter by 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
  - NAT gateways
  - Peering connections
  - Route servers

**Security**

- Network ACLs

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Internet gateway igw-030514beb936c8215 successfully attached to vpc-0c32270a23e57f69c

### igw-030514beb936c8215 / mini-project-igw

**Details** Info

Internet gateway ID igw-030514beb936c8215	State Attached	VPC ID vpc-0c32270a23e57f69c   mini-project-vpc	Owner 203081517573
--	-------------------	--	-----------------------

**Tags (1)**

Key	Value
Name	mini-project-igw

Manage tags

< 1 > | ⚙

Actions ▾

AWS project | LinkedIn | AWS-cloud/M | AWS Skill Built | Jaswanth! You | Share Badge | LinkedIn | Console Home | igws | VPC Co | + | Account ID: 2030-8151-7573 | United States (N. Virginia) | Jaswanth\_mini\_project

aws | Search | [Alt+S] | Actions ▾ Create internet gateway

VPC > Internet gateways

**Virtual private cloud**

Your VPCs

Subnets

Route tables

**Internet gateways** (2) Info

Name	Internet gateway ID	State	VPC ID	Owner
-	igw-04f77c53da6feab95	Attached	vpc-07fe485a707516e6b	203081517573
mini-project-igw	igw-030514beb936c8215	Attached	vpc-0c32270a23e57f69c   mini-project-...   203081517573	

**Select an internet gateway above**

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7 35°F Clear

## Route Table Creation

A public route table (mini-project-public-rt) was created to manage internet routing for the VPC's public subnets.

The screenshot shows the 'Create route table' page in the AWS VPC console. In the 'Route table settings' section, the name 'mini-project-public-rt' is specified, and the VPC 'vpc-0c32270a23e57f69c (mini-project-vpc)' is selected. Under 'Tags', a single tag 'Name' is added with the value 'mini-project-public-rt'. The 'Create route table' button is at the bottom right.

The screenshot shows the 'RouteTableDetails' page for the route table 'rtb-07f406d1174f0746a'. A success message states 'Route table rtb-07f406d1174f0746a | mini-project-public-rt was created successfully.' The 'Actions' button is visible on the right.

The screenshot shows the 'RouteTableDetails' page for the route table 'rtb-07f406d1174f0746a'. It displays a table of routes:

Destination	Target	Status	Propagated	Route Origin
10.0.0.0/16	local	Active	No	Create Route Table

The left sidebar shows navigation links for Virtual private cloud, Route tables, Security, and PrivateLink and Lattice.

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#EditRoutes:RouteTableId=rtb-07f406d1174f0746a

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Route tables > rtb-07f406d1174f0746a > Edit routes

### Edit routes

Destination	Target	Status	Propagated	Route Origin
10.0.0.0/16	local	Active	No	CreateRouteTable
0.0.0.0/0	Internet Gateway	-	No	CreateRoute
	igw-030514beb936c8215	-		

[Add route](#) [Remove](#)

[Cancel](#) [Preview](#) [Save changes](#)

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#RouteTableDetails:RouteTableId=rtb-07f406d1174f0746a

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Route tables > rtb-07f406d1174f0746a

Virtual private cloud

- Updated routes for rtb-07f406d1174f0746a / mini-project-public-rt successfully
- Details

### rtb-07f406d1174f0746a / mini-project-public-rt

[Actions](#)

**Details** [Info](#)

Route table ID rtb-07f406d1174f0746a	Main No	Explicit subnet associations -	Edge associations -
VPC vpc-0c32270a23e57f69c   mini-project-vpc	Owner ID 203081517573		

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

**Routes (2)**

Destination	Target	Status	Propagated	Route Origin
0.0.0.0/0	igw-030514beb936c8215	Active	No	Create Route
10.0.0.0/16	local	Active	No	Create Route Table

[Edit routes](#)

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20308151753-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#RouteTableDetails:RouteTableId=rtb-07f406d1174f0746a

aws | Search [Alt+S] | United States (N. Virginia) | Account ID: 2030-8151-7573 | Jaswanth\_mini\_project

VPC > Route tables > rtb-07f406d1174f0746a | vpc-0c32270a23e57f69c | mini-project-vpc | 20308151753

**Virtual private cloud**

- Your VPCs
- Subnets
- Route tables**
  - Internet gateways
  - Egress-only internet gateways
  - Carrier gateways
  - DHCP option sets
  - Elastic IPs
  - Managed prefix lists
  - NAT gateways
  - Peering connections
  - Route servers
- Security**
  - Network ACLs
  - Security groups
- PrivateLink and Lattice**
  - Getting started
  - Endpoints

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

**Explicit subnet associations (0)**

Find subnet association

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
No subnet associations You do not have any subnet associations.			

**Edit subnet associations**

**Subnets without explicit associations (4)**

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

Find subnet association

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
public-myproject-01	<a href="#">subnet-034f5b731fcdbbb5a</a>	10.0.1.0/24	-
public-myproject-02	<a href="#">subnet-0a5130f3f4dc219be</a>	10.0.2.0/24	-
private-myproject-01	<a href="#">subnet-04beaade7f37b864e</a>	10.0.3.0/24	-
private-myproject-02	<a href="#">subnet-09f8c62830bc40ab9</a>	10.0.4.0/24	-

**Edit subnet associations**

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AWS project | LinkedIn | AWS-cloud/M | AWS Skill Builders | Jaswanth! You | Share Badge | LinkedIn | Console Home | VPC | us-east-1 | + | - | X

20308151753-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#EditRouteTableSubnetAssociations:RouteTableId=rtb-07f406d1174f0746a

aws | Search [Alt+S] | United States (N. Virginia) | Account ID: 2030-8151-7573 | Jaswanth\_mini\_project

VPC > Route tables > rtb-07f406d1174f0746a > Edit subnet associations

### Edit subnet associations

Change which subnets are associated with this route table.

**Available subnets (2/4)**

Filter subnet associations

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
<input checked="" type="checkbox"/> public-myproject-01	<a href="#">subnet-034f5b731fcdbbb5a</a>	10.0.1.0/24	-	Main (rtb-0a84a52d746c583af)
<input checked="" type="checkbox"/> public-myproject-02	<a href="#">subnet-0a5130f3f4dc219be</a>	10.0.2.0/24	-	Main (rtb-0a84a52d746c583af)
<input type="checkbox"/> private-myproject-01	<a href="#">subnet-04beaade7f37b864e</a>	10.0.3.0/24	-	Main (rtb-0a84a52d746c583af)
<input type="checkbox"/> private-myproject-02	<a href="#">subnet-09f8c62830bc40ab9</a>	10.0.4.0/24	-	Main (rtb-0a84a52d746c583af)

**Selected subnets**

[subnet-034f5b731fcdbbb5a / public-myproject-01](#) [subnet-0a5130f3f4dc219be / public-myproject-02](#)

**Save associations**

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The screenshot shows the AWS VPC Route Table Details page. The route table ID is rtb-07f406d1174f0746a, and it has two explicit subnet associations: subnet-034fb731fcdbbb5a (IPv4 CIDR 10.0.1.0/24) and subnet-0a5130f3f4dc219be (IPv4 CIDR 10.0.2.0/24). There are no edge associations.

## NAT Gateway Creation

A NAT Gateway (mini-project-natgw) was created to provide secure outbound internet access for private subnets, allowing EC2 instances to download updates and communicate externally without being exposed to the public internet.

The screenshot shows the AWS VPC Create NAT gateway page. The name is set to mini-project-natgw, availability mode is Regional - new, and the VPC is selected as vpc-0c32270a23e57f69c (mini-project-vpc). The connectivity type is Public, and the method of Elastic IP (EIP) allocation is Automatic.

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#NatGatewayDetails:natGatewayId=nat-13221ee7f80645881

aws | Search [Alt+S] | United States (N. Virginia) | Account ID: 2030-8151-7573 | Jaswanth\_mini\_project

VPC > NAT gateways > nat-13221ee7f80645881

NAT gateway nat-13221ee7f80645881 | mini-project-natgw was created successfully.

## nat-13221ee7f80645881 / mini-project-natgw

**Actions**

**Virtual private cloud**

- Your VPCs
- Subnets
- Route tables
- Internet gateways
- Egress-only internet gateways
- Carrier gateways
- DHCP option sets
- Elastic IPs
- Managed prefix lists
- NAT gateways**
- Peering connections
- Route servers

**Security**

- Network ACLs
- Security groups

**PrivateLink and Lattice**

- Getting started
- Endpoints

**IP addresses** | Monitoring | Flow logs | Tags

### Associated IP addresses

Search

IP address	Status	Availability Zone	Allocation ID
No associated IP addresses found. If this NAT gateway was recently created with the automatic allocation method, your IP addresses are still being allocated. Click the refresh button to view them			

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#NatGateways:

aws | Search [Alt+S] | United States (N. Virginia) | Account ID: 2030-8151-7573 | Jaswanth\_mini\_project

VPC > NAT gateways

### NAT gateways (1) Info

Find NAT gateways by attribute or tag

Name	NAT gateway ID	Connectivity...	State	State message	Availability ...	Route table ID	P
mini-project-natgw	nat-13221ee7f80645881	Public	Available	-	Regional	rtb-03e821fada...	1

**Select a NAT gateway**

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#RouteTableDetails:RouteTableId=rtb-04341573876ec6983

aws | Search [Alt+S] | United States (N. Virginia) | Account ID: 2030-8151-7573 | Jaswanth\_mini\_project

VPC > Route tables > rtb-04341573876ec6983

Virtual private cloud

- Your VPCs
- Subnets
- Route tables**
- Internet gateways
- Egress-only internet gateways
- Carrier gateways
- DHCP option sets
- Elastic IPs
- Managed prefix lists
- NAT gateways
- Peering connections
- Route servers

Security

- Network ACLs
- Security groups

PrivateLink and Lattice

- Getting started
- Endpoints

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**rtb-04341573876ec6983 / mini-project-private-rt**

**Details** Info

Route table ID rtb-04341573876ec6983	Main No	Explicit subnet associations -	Edge associations -
VPC vpc-0c32270a23e57f69c   mini-project-vpc	Owner ID 203081517573		

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

**Routes (1)**

Destination	Target	Status	Propagated	Route Origin
10.0.0.0/16	local	Active	No	Create Route Table

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1>EditRoutes:RouteTableId=rtb-04341573876ec6983

aws | Search [Alt+S] | United States (N. Virginia) | Account ID: 2030-8151-7573 | Jaswanth\_mini\_project

VPC > Route tables > rtb-04341573876ec6983 > Edit routes

### Edit routes

Destination	Target	Status	Propagated	Route Origin
10.0.0.0/16	local	Active	No	CreateRouteTable
0.0.0.0/0	NAT Gateway	-	No	CreateRoute

Add route Remove Cancel Preview Save changes

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Screenshot of the AWS VPC Route Tables console showing the successful update of routes for route table rtb-04341573876ec6983.

**Details Info**

- Route table ID: rtb-04341573876ec6983
- Main: No
- Owner ID: 203081517573
- Explicit subnet associations: -
- Edge associations: -

**Routes (2)**

Destination	Target	Status	Propagated	Route Origin
0.0.0.0/0	nat-13221ee7f80645881	Active	No	Create Route
10.0.0.0/16	local	Active	No	Create Route Table

**Subnet associations**

You have successfully updated subnet associations for rtb-04341573876ec6983 / mini-project-private-rt.

**Explicit subnet associations (2)**

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
private-myproject-01	subnet-04beaade7f37b864e	10.0.3.0/24	-
private-myproject-02	subnet-09f8c62830bc40ab9	10.0.4.0/24	-

**Subnets without explicit associations (0)**

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

Screenshot of the AWS VPC Route Tables console showing the successful update of subnet associations for route table rtb-04341573876ec6983.

**Details Info**

- Route table ID: rtb-04341573876ec6983
- Main: No
- Owner ID: 203081517573
- Explicit subnet associations: 2 subnets
- Edge associations: -

**Subnet associations**

You have successfully updated subnet associations for rtb-04341573876ec6983 / mini-project-private-rt.

**Explicit subnet associations (2)**

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
private-myproject-01	subnet-04beaade7f37b864e	10.0.3.0/24	-
private-myproject-02	subnet-09f8c62830bc40ab9	10.0.4.0/24	-

**Subnets without explicit associations (0)**

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

## ALB Security Group

Created a security group (mini-project-alb-sg) to allow HTTP traffic to the Application Load Balancer from the internet.

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateSecurityGroup:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Security Groups > Create security group

## Create security group Info

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

**Basic details**

**Security group name Info**  
mini-project-alb-sg  
Name cannot be edited after creation.

**Description Info**  
ALB Security Group

**VPC Info**  
vpc-0c32270a23e57f69c (mini-project-vpc)

**Inbound rules Info**  
This security group has no inbound rules.  
[Add rule](#)

**Outbound rules Info**

Type <small>Info</small>	Protocol <small>Info</small>	Port range <small>Info</small>	Destination <small>Info</small>	Description - optional <small>Info</small>
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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateSecurityGroup:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Security Groups > Create security group

## Create security group Info

**VPC Info**  
vpc-0c32270a23e57f69c (mini-project-vpc)

**Inbound rules Info**

Type <small>Info</small>	Protocol <small>Info</small>	Port range <small>Info</small>	Source <small>Info</small>	Description - optional <small>Info</small>
HTTP	TCP	80	Anywh... ▾	ALB must accept requests from any internet user <a href="#">Delete</a>
0.0.0.0/0 <a href="#">X</a>				ALB must accept requests from any internet user

[Add rule](#)

⚠ Rules with source of 0.0.0.0/0 or ::/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses. [X](#)

**Outbound rules Info**

Type <small>Info</small>	Protocol <small>Info</small>	Port range <small>Info</small>	Destination <small>Info</small>	Description - optional <small>Info</small>
All traffic	All	All	Custom ▾	0.0.0.0/0 <a href="#">X</a>

[Add rule](#)

⚠ Rules with destination of 0.0.0.0/0 or ::/0 allow your instances to send traffic to any IPv4 or IPv6 address. We recommend setting security group rules to be more restrictive and to only allow traffic to specific known IP addresses. [X](#)

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#SecurityGroup:groupId=sg-047e0be78bd9914bf

VPC > Security Groups > sg-047e0be78bd9914bf - mini-project-alb-sg

**sg-047e0be78bd9914bf - mini-project-alb-sg**

**Details**

Security group name mini-project-alb-sg	Security group ID sg-047e0be78bd9914bf	Description ALB Security Group	VPC ID vpc-0c32270a23e57f69c
Owner 203081517573	Inbound rules count 1 Permission entry	Outbound rules count 1 Permission entry	

Inbound rules | Outbound rules | Sharing - new | VPC associations - new | Tags

**Inbound rules (1)**

Name	Security group rule ID	IP version	Type	Protocol	Port range
-	sgr-0f20dab3fa2da48c2	IPv4	HTTP	TCP	80

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#SecurityGroups:

VPC > Security Groups

**Security Groups (3) Info**

Name	Security group ID	Security group name	VPC ID	Description
-	sg-047e0be78bd9914bf	mini-project-alb-sg	vpc-0c32270a23e57f69c	ALB Security Gro
-	sg-02a9a697ac2416a20	default	vpc-0c32270a23e57f69c	default VPC secur
-	sg-039600feb1938244e	default	vpc-07fe485a707516e6b	default VPC secur

Select a security group

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## EC2 Security Group

Created mini-project-ec2-sg to allow HTTP traffic only from the ALB security group, securing backend EC2 instances.

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203081517573-a4etx75l.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateSecurityGroup:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Security Groups > Create security group

### Create security group Info

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

**Basic details**

**Security group name** Info  
mini-project-ec2-sg  
Name cannot be edited after creation.

**Description** Info  
EC2 backend security group

**VPC Info**  
vpc-0c32270a23e57f69c (mini-project-vpc)

**Inbound rules** Info

This security group has no inbound rules.

[Add rule](#)

**Outbound rules** Info

Type	Protocol	Port range	Destination	Description - optional
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203081517573-a4etx75l.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateSecurityGroup:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Security Groups > Create security group

### Create security group Info

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

**Basic details**

**Security group name** Info  
mini-project-ec2-sg  
Name cannot be edited after creation.

**Description** Info  
EC2 backend security group

**VPC Info**  
vpc-0c32270a23e57f69c (mini-project-vpc)

**Inbound rules** Info

Type	Protocol	Port range	Source	Description - optional
HTTP	TCP	80	Custom	sg-047e0be78bd9914b <a href="#">Delete</a>
				sg-047e0be78bd9914bf <a href="#">Delete</a>

[Add rule](#)

**Outbound rules** Info

Type	Protocol	Port range	Destination	Description - optional
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Screenshot of the AWS VPC Security Groups console showing the creation of a new security group named "sg-08ccfe5ae7b5a3d77 - mini-project-ec2-sg".

**Details:**

Security group name: mini-project-ec2-sg	Security group ID: sg-08ccfe5ae7b5a3d77	Description: EC2 backend security group	VPC ID: vpc-0c32270a23e57f69c
Owner: 203081517573	Inbound rules count: 1 Permission entry	Outbound rules count: 1 Permission entry	

**Inbound rules (1):**

Name	Security group rule ID	IP version	Type	Protocol	Port range
-	sgr-0479d92abf2cca7ed	-	HTTP	TCP	80

**Outbound rules:**

Name	Security group rule ID	IP version	Type	Protocol	Port range
-	sor-0479d92abf2cca7ed	-	HTTP	TCP	80

**Sharing:** Sharing - new

**VPC associations:** VPC associations - new

**Tags:** Tags

**Actions:** Actions ▾

Screenshot of the AWS VPC Security Groups console showing the list of existing security groups.

**Security Groups (4) Info:**

Name	Security group ID	Security group name	VPC ID	Description
-	sg-047e0be78bd9914bf	mini-project-alb-sg	vpc-0c32270a23e57f69c	ALB Security Group
-	sg-08ccfe5ae7b5a3d77	mini-project-ec2-sg	vpc-0c32270a23e57f69c	EC2 backend security group
-	sg-02a9a697ac2416a20	default	vpc-0c32270a23e57f69c	default VPC security group
-	sg-039600fah1938244p	default	vnr-07fe485a707516efh	default VPC security group

**Select a security group:**

**Actions:** Actions ▾

**Export security groups to CSV:** Export security groups to CSV ▾

**Create security group:** Create security group

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## Target Group Creation

A target group (mini-project-tg) was created using HTTP on port 80 to route traffic from the Application Load Balancer to backend EC2 instances within the VPC.

Screenshot of the AWS CloudFront Create Target Group wizard Step 1: Create target group.

**Step 1**

**Create target group**

Step 2 - recommended  
Register targets

Step 3  
Review and create

**Create target group**

A target group can be made up of one or more targets. Your load balancer routes requests to the targets in a target group and performs health checks on the targets.

**Settings - immutable**

Choose a target type and the load balancer and listener will route traffic to your target. These settings can't be modified after target group creation.

**Target type**

Indicate what resource type you want to target. Only the selected resource type can be registered to this target group.

Instances

Supports load balancing to instances in a VPC. Integrate with Auto Scaling Groups or ECS services for automatic management.

Suitable for: ALB NLB GWLB

IP addresses

Supports load balancing to VPC and on-premises resources. Facilitates routing to IP addresses and network interfaces on the same instance. Supports IPv6 targets.

Suitable for: ALB NLB GWLB

Lambda function

Supports load balancing to a single Lambda function. ALB required as traffic source.

Suitable for: ALB

Application Load Balancer

Allows use of static IP addresses and PrivateLink with an Application Load Balancer. NLB required as traffic source.

Suitable for: NLB

**Target group name**

Name must be unique per Region per AWS account.

mini-project-tg

Accepts: a-z, A-Z, 0-9, and hyphen (-). Can't begin or end with hyphen. 1-32 total characters; Count: 15/32

**Protocol**

**Port**

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Screenshot of the AWS CloudFront Create Target Group wizard Step 1: Create target group.

Only targets with the indicated IP address type can be registered to this target group.

IPv4

Each instance has a default network interface (eth0) that is assigned the primary private IPv4 address. The instance's primary private IPv4 address is the one that will be applied to the target.

IPv6

Each instance you register must have an assigned primary IPv6 address. This is configured on the instance's default network interface (eth0). [Learn more](#)

**VPC**

Select the VPC with the instances that you want to include in the target group. Only VPCs that support the IP address type selected above are available in this list.

vpc-0c32270a23e57f69c (mini-project-vpc)

[Create VPC](#)

**Protocol version**

HTTP1

Send requests to targets using HTTP/1.1. Supported when the request protocol is HTTP/1.1 or HTTP/2.

HTTP2

Send requests to targets using HTTP/2. Supported when the request protocol is HTTP/2 or gRPC, but gRPC-specific features are not available.

gRPC

Send requests to targets using gRPC. Supported when the request protocol is gRPC.

**Health checks**

The associated load balancer periodically sends requests, per the settings below, to the registered targets to test their status.

**Health check protocol**

HTTP

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Screenshot of the AWS Cloud Console showing the creation of a new Target Group named "mini-project-tg".

**Target group details:**

- Name: mini-project-tg
- Target type: Instance
- Protocol: Port
- Protocol version: HTTP1
- VPC: vpc-0c32270a23e57f69c
- IP address type: IPv4

**Health check details:**

- Health check protocol: HTTP
- Health check path: /
- Health check port: traffic-port
- Interval: 30 seconds
- Timeout: 5 seconds
- Healthy threshold: 5
- Unhealthy threshold: 2
- Success codes: 200

**Step 2: Register targets**

Targets (0)

Instance ID	Name	Port	Zone
No targets added			

Screenshot of the AWS Cloud Console showing the configuration of the created Target Group "mini-project-tg".

**Details:**

- Target type: Instance
- Protocol: Port
- Protocol version: HTTP1
- VPC: vpc-0c32270a23e57f69c
- IP address type: IPv4
- Load balancer: None associated

**Metrics:**

Total targets	Healthy	Unhealthy	Unused	Initial	Draining
0	0	0	0	0	0
0 Anomalous					

**Registered targets (0) Info**

Anomaly mitigation: Not applicable

Actions: Deregister, Register targets

Targets | Monitoring | Health checks | Attributes | Tags

Filter targets

## Application Load Balancer

Created an internet-facing ALB (mini-project-alb) across two AZs to distribute HTTP traffic to the backend target group.

(3) LinkedIn AWS-cloud/Multi AWS Skill Builder Jaswanthi You just Share Badge - Create application AWS project guid

203081517573-a4etx75l.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateALBWizard:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

EC2 > Load balancers > Create Application Load Balancer

### Basic configuration

**Load balancer name**  
Name must be unique within your AWS account and can't be changed after the load balancer is created.  
 A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

**Scheme** | **Info**  
Scheme can't be changed after the load balancer is created.

**Internet-facing**  
• Serves internet-facing traffic.  
• Has public IP addresses.  
• DNS name resolves to public IPs.  
• Requires a public subnet.

**Internal**  
• Serves internal traffic.  
• Has private IP addresses.  
• DNS name resolves to private IPs.  
• Compatible with the IPv4 and Dualstack IP address types.

**Load balancer IP address type** | **Info**  
Select the front-end IP address type to assign to the load balancer. The VPC and subnets mapped to this load balancer must include the selected IP address types. Public IPv4 addresses have an additional cost.

**IPv4**  
Includes only IPv4 addresses.

**Dualstack**  
Includes IPv4 and IPv6 addresses.

**Dualstack without public IPv4**  
Includes a public IPv6 address, and private IPv4 and IPv6 addresses. Compatible with **internet-facing** load balancers only.

### Network mapping

The load balancer routes traffic to targets in the selected subnets, and in accordance with your IP address settings.

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203081517573-a4etx75l.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateALBWizard:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

EC2 > Load balancers > Create Application Load Balancer

### VPC | **Info**

The load balancer will exist and scale within the selected VPC. The selected VPC is also where the load balancer targets must be hosted unless routing to Lambda or on-premises targets, or if using VPC peering. To confirm the VPC for your targets, view [target groups](#).

vpc-0c32270a23e57f69c (mini-project-vpc)  
10.0.0.0/16

**Create VPC**

### IP pools

You can optionally choose to configure an IPAM pool as the preferred source for your load balancers IP addresses. Create or view Pools in the [Amazon VPC IP Address Manager console](#).

**Use IPAM pool for public IPv4 addresses**  
The IPAM pool you choose will be the preferred source of public IPv4 addresses. If the pool is depleted IPv4 addresses will be assigned by AWS.

### Availability Zones and subnets

Select at least two Availability Zones and a subnet for each zone. A load balancer node will be placed in each selected zone and will automatically scale in response to traffic. The load balancer routes traffic to targets in the selected Availability Zones only.

**us-east-1a (use1-az1)**  
Subnet  
Only CIDR blocks corresponding to the load balancer IP address type are used. At least 8 available IP addresses are required for your load balancer to scale efficiently.  
subnet-034fb731fcdbbb5a  
IPv4 subnet CIDR: 10.0.1.0/24

**us-east-1b (use1-az2)**  
Subnet  
Only CIDR blocks corresponding to the load balancer IP address type are used. At least 8 available IP addresses are required for your load balancer to scale efficiently.  
subnet-0a5130f3f4dc219be  
IPv4 subnet CIDR: 10.0.2.0/24

**public-myproject-01**

**public-myproject-02**

### Security groups

A security group is a collection of rules that define which traffic is allowed into and out of your instances. You can apply multiple security groups to an instance. You can also apply security groups to targets in a target group.

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateALBWizard:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

EC2 > Load balancers > Create Application Load Balancer

Subnet us-east-1b (use1-az2)  
IPv4 subnet CIDR: 10.0.1.0/24

us-east-1b (use1-az2)  
Subnet  
Only CIDR blocks corresponding to the load balancer IP address type are used. At least 8 available IP addresses are required for your load balancer to scale efficiently.  
subnet-0a5130f3f4dc219be  
IPv4 subnet CIDR: 10.0.2.0/24

public-myproject-02

**Security groups** Info  
A security group is a set of firewall rules that control the traffic to your load balancer. Select an existing security group, or you can [create a new security group](#).

**Security groups**  
Select up to 5 security groups

mini-project-alb-sg sg-047e0be78bd9914bf VPC: vpc-0c32270a23e57f69c

**Listeners and routing** Info  
A listener is a process that checks for connection requests using the port and protocol you configure. The rules that you define for a listener determine how the load balancer routes requests to its registered targets.

▼ Listener HTTP:80  
Protocol Port Remove

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateALBWizard:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

EC2 > Load balancers > Create Application Load Balancer

**Routing action**  
 Forward to target groups  Redirect to URL  Return fixed response

**Forward to target group** Info  
Choose a target group and specify routing weight or [create target group](#).

**Target group**  
mini-project-tg Target type: Instance, IPv4 | Target stickiness: Off  
HTTP Weight 1 Percent 100%  
0.999

+ Add target group  
You can add up to 4 more target groups.

**Target group stickiness** Info  
Enables the load balancer to bind a user's session to a specific target group. To use stickiness the client must support cookies. If you want to bind a user's session to a specific target, turn on the Target Group attribute Stickiness.  
 Turn on target group stickiness

**Listener tags - optional**  
Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.

Add listener tag  
You can add up to 50 more tags.

Add listener

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## Launch Template

Created a launch template (mini-project-lt) using Amazon Linux 2023 and t2.micro to define the EC2 configuration for the Auto Scaling Group.

In | Feed | LinkedIn | AWS-cloud/M | AWS Skill Buil | Jaswanth! You | Share Badge | LinkedIn | Create launch | Target group: | AWS project g | +

203081517573-a4etbx75l.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateTemplate:

aws | Search [Alt+S] | United States (N. Virginia) | Account ID: 2030-8151-7573 | Jaswanth\_min\_project

Search results

## Application and OS Images (Amazon Machine Image) Info

An AMI contains the operating system, application server, and applications for your instance. If you don't see a suitable AMI below, use the search field or choose [Browse more AMIs](#).

[AMI from catalog](#) [Quick Start](#)

**Name** Verified provider

Amazon Linux 2023 kernel-6.1 AMI

**Description**

Amazon Linux 2023 (kernel-6.1) is a modern, general purpose Linux-based OS that comes with 5 years of long term support. It is optimized for AWS and designed to provide a secure, stable and high-performance execution environment to develop and run your cloud applications.

Amazon Linux 2023 AMI 2023.9.20251117.1 x86\_64 HVM kernel-6.1

**Image ID**  
ami-0fa3fe0fa7920f68e

**Username** (i)  
ec2-user

Catalog	Published	Architecture	Virtualization	Root device type	ENAv Enabled
Quick Start AMIs	2025-11-17T16:52:48.000Z	x86_64	hvm	ebs	Yes

▶ Summary

[Cancel](#) [Create launch template](#)

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateTemplate:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

Search results

Instance type [Info](#) [Get advice](#)

Advanced

t2.micro

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

On-Demand Windows base pricing: 0.0162 USD per Hour

On-Demand Ubuntu Pro base pricing: 0.0134 USD per Hour

On-Demand SUSE base pricing: 0.0116 USD per Hour On-Demand RHEL base pricing: 0.026 USD per Hour

On-Demand Linux base pricing: 0.0116 USD per Hour

All generations

Compare instance types

Additional costs apply for AMIs with pre-installed software

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

Don't include in launch template [Create new key pair](#)

Network settings [Info](#)

Subnet [Info](#)

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateTemplate:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

Search results

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

Don't include in launch template [Create new key pair](#)

Network settings [Info](#)

Subnet [Info](#)

Don't specify a subnet, a network interface is automatically added to your template. [Create new subnet](#)

When you specify a subnet, a network interface is automatically added to your template.

Availability Zone [Info](#)

Don't include in launch template [Enable additional zones](#)

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.

Select existing security group  Create security group

Security groups [Info](#)

Select security groups

mini-project-ec2-sg sg-08ccfe5ae7b5a3d77 [X](#)

VPC: vpc-0c32270a23e57f69c

Advanced network configuration

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The screenshot shows the AWS EC2 Launch Templates page. The main content area displays the 'mini-project-lt' launch template with the ID lt-0e7c63c8182c0ebe4. The 'Launch template details' section includes fields for Launch template ID, Launch template name (set to 'mini-project-lt'), Default version (set to 1), and Owner (set to arnawsiam:20301517573:user/Jaswanth\_mini\_project). Below this, the 'Launch template version details' section shows one version (Default) with AMI ID ami-0fa3fe0fa7920f68e, Instance type t2.micro, and Security group sg-08ccfe5ae7b5a3d77. The page also includes a sidebar with navigation links for Instances, Images, Elastic Block Store, and Network & Security.

## Auto Scaling Group Setup

An Auto Scaling Group (mini-project-asg) was created using the launch template to automatically manage EC2 instances across multiple Availability Zones for high availability and elasticity.

The screenshot shows the 'Create Auto Scaling group' wizard at Step 1: Choose launch template. The user has selected the 'Choose launch template' option. The 'Name' field is set to 'mini-project-asg'. The 'Launch template' dropdown is set to 'mini-project-lt'. A note indicates that accounts created after May 31, 2023, can only support creating Auto Scaling groups with launch templates. The page also includes a sidebar with navigation links for CloudShell, Feedback, and Console Mobile App.

Screenshot of the AWS Cloud Console showing the 'Create Auto Scaling group' wizard Step 1: Choose launch template.

The page shows a summary of the selected launch template 'mini-project-lt' (version Default). It includes fields for AMI ID (ami-0fa3fe0fa7920f68e), Key pair name (empty), Security groups (empty), and Security group IDs (sg-08ccfe5ae7b5a3d77). Additional details show Storage (volumes) and Date created (Thu Dec 04 2025 08:31:46 GMT-0500).

Buttons at the bottom right include 'Cancel' and 'Next'.

Screenshot of the AWS Cloud Console showing the 'Create Auto Scaling group' wizard Step 2: Choose instance launch options.

The left sidebar lists steps: Step 1 (Choose launch template), Step 2 (Choose instance launch options), Step 3 - optional (Integrate with other services), Step 4 - optional (Configure group size and scaling), Step 5 - optional (Add notifications), Step 6 - optional (Add tags), and Step 7 (Review).

The main content area shows the 'Choose instance launch options' step. It includes sections for 'Instance type requirements' (overrides launch template), 'Launch template' (mini-project-lt, version Default, description: Initial version for ASG), 'Instance type' (t2.micro), and 'Network' (VPC: vpc-0c32270a23e57f69c (mini-project-vpc)).

Buttons at the bottom right include 'Override launch template' and 'Create a VPC'.

203081517573-a4etx75.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup:

Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

EC2 > Auto Scaling groups > Create Auto Scaling group

Choose the VPC that defines the virtual network for your Auto Scaling group.

vpc-0c32270a23e57f69c (mini-project-vpc)  
10.0.0.0/16

Create a VPC ↗

**Availability Zones and subnets**  
Define which Availability Zones and subnets your Auto Scaling group can use in the chosen VPC.

Select Availability Zones and subnets ↗

use1-az1 (us-east-1a) | subnet-04beaade7f37b864e (private-myproject-01)  
10.0.3.0/24

use1-az2 (us-east-1b) | subnet-09f8c62830bc40ab9 (private-myproject-02)  
10.0.4.0/24

Create a subnet ↗

**Availability Zone distribution - new**  
Auto Scaling automatically balances instances across Availability Zones. If launch failures occur in a zone, select a strategy.

**Balanced best effort**  
If launches fail in one Availability Zone, Auto Scaling will attempt to launch in another healthy Availability Zone.

**Balanced only**  
If launches fail in one Availability Zone, Auto Scaling will continue to attempt to launch in the unhealthy Availability Zone to preserve balanced distribution.

Cancel Skip to review Previous Next

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34°F Cloudy Search ENG IN 08:36 04-12-2025

203081517573-a4etx75.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup:

Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

EC2 > Auto Scaling groups > Create Auto Scaling group

Step 2 Choose instance launch options

Step 3 - optional Integrate with other services

Step 4 - optional Configure group size and scaling

Step 5 - optional Add notifications

Step 6 - optional Add tags

Step 7 Review

Use a load balancer to distribute network traffic across multiple servers. Enable service-to-service communications with VPC Lattice. Shift resources away from impaired Availability Zones with zonal shift. You can also customize health check replacements and monitoring.

**Load balancing** Info Use the options below to attach your Auto Scaling group to an existing load balancer, or to a new load balancer that you define.

**Select Load balancing options**

No load balancer Traffic to your Auto Scaling group will not be fronted by a load balancer.

Attach to an existing load balancer Choose from your existing load balancers.

Attach to a new load balancer Quickly create a basic load balancer to attach to your Auto Scaling group.

**Attach to an existing load balancer**

**Select the load balancers to attach**

Choose from your load balancer target groups This option allows you to attach Application, Network, or Gateway Load Balancers.

Choose from Classic Load Balancers

**Existing load balancer target groups**  
Only instance target groups that belong to the same VPC as your Auto Scaling group are available for selection.

Select target groups ↗

mini-project-tg | HTTP Application Load Balancer: mini-project-alb

**VPC Lattice integration options** Info

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34°F Cloudy Search ENG IN 08:37 04-12-2025

203081517573-a4etx75.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

EC2 > Auto Scaling groups > Create Auto Scaling group

### Health checks

Health checks increase availability by replacing unhealthy instances. When you use multiple health checks, all are evaluated, and if at least one fails, instance replacement occurs.

#### EC2 health checks

Always enabled

Additional health check types - optional | Info

Turn on Elastic Load Balancing health checks Recommended

Elastic Load Balancing monitors whether instances are available to handle requests. When it reports an unhealthy instance, EC2 Auto Scaling can replace it on its next periodic check.

EC2 Auto Scaling will start to detect and act on health checks performed by Elastic Load Balancing. To avoid unexpected terminations, first verify the settings of these health checks in the [Load Balancer console](#)

Turn on VPC Lattice health checks

VPC Lattice can monitor whether instances are available to handle requests. If it considers a target as failed a health check, EC2 Auto Scaling replaces it after its next periodic check.

Turn on Amazon EBS health checks

EBS monitors whether an instance's root volume or attached volume stalls. When it reports an unhealthy volume, EC2 Auto Scaling can replace the instance on its next periodic health check.

#### Health check grace period | Info

This time period delays the first health check until your instances finish initializing. It doesn't prevent an instance from terminating when placed into a non-running state.

60 seconds

Cancel Skip to review Previous Next

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34°F Cloudy Search ENG IN 08:37 04-12-2025

203081517573-a4etx75.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup:

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

EC2 > Auto Scaling groups > Create Auto Scaling group

Step 1 Choose launch template

Step 2 Choose instance launch options

Step 3 - optional Integrate with other services

Step 4 - optional Configure group size and scaling

Step 5 - optional Add notifications

Step 6 - optional Add tags

Step 7 Review

### Configure group size and scaling - optional

Define your group's desired capacity and scaling limits. You can optionally add automatic scaling to adjust the size of your group.

#### Group size

Set the initial size of the Auto Scaling group. After creating the group, you can change its size to meet demand, either manually or by using automatic scaling.

#### Desired capacity type

Choose the unit of measurement for the desired capacity value. vCPUs and Memory(GiB) are only supported for mixed instances groups configured with a set of instance attributes.

Units (number of instances)

#### Desired capacity

Specify your group size.

2

### Scaling

You can resize your Auto Scaling group manually or automatically to meet changes in demand.

#### Scaling limits

Set limits on how much your desired capacity can be increased or decreased.

Min desired capacity: 2 Equal or less than desired capacity

Max desired capacity: 4 Equal or greater than desired capacity

#### Automatic scaling - optional

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup:

Search [Alt+S] Account ID: 2030-8151-7573 United States (N. Virginia) Jaswanth\_mini\_project

EC2 > Auto Scaling groups > Create Auto Scaling group

Step 1: Choose launch template

Step 2: Choose instance launch options

Step 3 - optional: Integrate with other services

Step 4 - optional: Configure group size and scaling

Step 5 - optional: Add notifications

Step 6 - optional: Add tags

Step 7: Review

**Review** Info

**Step 1: Choose launch template**

**Group details**

Auto Scaling group name: mini-project-asg

**Launch template**

Launch template: mini-project-lt (lt-0e7c63c8182c0ebe4)

Version: Default

Description: Initial version for ASG

**Step 2: Choose instance launch options**

**Network**

VPC: vpc-0c32270a23e57f69c

**Availability Zones and subnets**

Availability Zone	Subnet	Subnet CIDR range
use1-az1 (us-east-1a)	subnet-04beaade7f37b864e	10.0.3.0/24
use1-az2 (us-east-1b)	subnet-09f8c62830bc40ab9	10.0.4.0/24

**Step 3: Integrate with other services**

**Load balancing**

Load balancer 1

Name	Type	Target group
mini-project-alb	Application/HTTP	mini-project-tg

**VPC Lattice integration options**

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup:

Search [Alt+S] Account ID: 2030-8151-7573 United States (N. Virginia) Jaswanth\_mini\_project

EC2 > Auto Scaling groups > Create Auto Scaling group

**Availability Zone**

Availability Zone	Subnet	Subnet CIDR range
use1-az1 (us-east-1a)	subnet-04beaade7f37b864e	10.0.3.0/24
use1-az2 (us-east-1b)	subnet-09f8c62830bc40ab9	10.0.4.0/24

**Availability Zone distribution**

Balanced best effort

**Instance type requirements**

This Auto Scaling group will adhere to the launch template.

**Step 3: Integrate with other services**

**Load balancing**

Load balancer 1

Name	Type	Target group
mini-project-alb	Application/HTTP	mini-project-tg

**VPC Lattice integration options**

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Screenshot of the AWS Cloud Console showing the "Create Auto Scaling group" wizard, Step 4: Configure group size and scaling policies.

**Group size**

Desired capacity 2	Desired capacity type Units (number of instances)
-----------------------	--

**Scaling**

Minimum desired capacity 2	Maximum desired capacity 4
Target tracking policy -	

**Instance maintenance policy**

Replacement behavior No policy	Min healthy percentage -	Max healthy percentage -
-----------------------------------	-----------------------------	-----------------------------

**Additional settings**

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Screenshot of the AWS Cloud Console showing the Instances page.

**Instances (2) Info**

Instance state	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4
Running	i-0f85245a5a942df13	i-0f85245a5a942df13	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1b	-
Running	i-060dffac6b60be24e	i-060dffac6b60be24e	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	-

**Select an instance**

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**Navigation and Filter Bar**

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**System Status**

- 34°F Cloudy
- ENG IN
- 08:49
- 04-12-2025

Screenshot of the AWS EC2 Target Groups console showing the 'mini-project-tg' target group. The summary indicates 2 total targets, with 2 healthy and 0 unhealthy. The distribution of targets by Availability Zone (AZ) shows 2 targets in us-east-1a and 0 in us-east-1b.

Category	Value
Total targets	2
Healthy	2
Unhealthy	0
Unused	0
Initial	0
Draining	0

**Registered targets (2)**

Instance ID	Name	Port	Zone	Health status	Health status details	Admini...	Overri...
i-060dfffac6b60be24e		80	us-east-1a (us...)	Healthy	-	No override.	No over...
i-0f85245a5a942df13		80	us-east-1b (us...)	Healthy	-	No override.	No over...

## Web Application Firewall (AWS WAF)

Created a Web ACL and attached it to the ALB to add managed security rules and protect the application from common web attacks.

Screenshot of the AWS WAF & Shield Protection packs (web ACLs) creation page. A blue banner introduces the new WAF console experience.

**Create protection pack (web ACL)**

**Tell us about your app**

Sharing your app category and app focus detail helps AWS recommend the best security protection.

**App category**

Select one or more app categories

**App focus**

- Both API and web
- API
- Web

**Select resources to protect (0)**

Find a resource by its name or type

Screenshot of the AWS WAF & Shield console showing the "Create protection pack (web ACL)" step. The "App focus" section is set to "Web". The "Select resources to protect" section shows one resource selected: "mini-project-alb" (Application Load Balancer). A modal window is open, listing the selected resource.

**App focus**

- Both API and web
- API
- Web

**Select resources to protect**

**Resources (1)**

Name	Type
mini-project-alb	Application Load Balancer

No resources to display

You can add regional or global resources, or skip this step to continue.

[Skip for now](#)

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ENG IN 09:24 04-12-2025

Screenshot of the AWS WAF & Shield console showing the "Create protection pack (web ACL)" step. The "App focus" section is set to "Web". The "Select resources to protect" section shows one resource selected: "mini-project-alb" (Application Load Balancer). The "Choose initial protections" section offers three options: "Recommended", "Essentials", and "You build it".

**App focus**

- Both API and web
- API
- Web

**Select resources to protect (1) Info**

Name	Type
mini-project-alb	Application Load Balancer

**Choose initial protections Info**

AWS WAF offers various protection packages of WAF rules. AWS WAF rule configurations are based on security best practices. You should validate the rule configurations that are best for you. You can also choose individual rules instead of packages.

**Recommended**

**Recommended rules for you**  
Enables recommended rules for the selected application categories and app focus.

**Essentials**

**Essential rules**  
Enables essential rules for the selected application categories and app focus.

**You build it**

**Build your own pack from all of the protections AWS WAF offers**  
Select and customize rules to fit your needs.

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ENG IN 09:24 04-12-2025

203081517573-a4etx75l.us-east-1.console.aws.amazon.com/wafv2-pro/protections/onboarding?region=us-east-1&panel=onboardingRules&scope=regional

WAF & Shield > Protection packs (web ACLs) > Create protection pack (web ACL)

### Choose initial protections

AWS WAF offers various protection packages of WAF rules. AWS WAF rule configurations are based on security best practices. You should validate the rule configurations that are best for you. You can also choose individual rules instead of packages.

**Recommended**

- Recommended rules for you**: Enables recommended rules for the selected application categories and app focus.
- Everything in Essentials**: and the following
  - ✓ Rate limit for GET requests [Count](#)
  - ✓ Rate limit for POST, PUT, DELETE requests [Count](#)
  - ✓ Amazon IP reputation list [Default](#)

**Essentials**

- Essential rules**: Enables essential rules for the selected application categories and app focus.
  - ✓ Layer 7 anti-DDoS [Default](#)
  - ✓ IP allowlist [Allow](#)
  - ✓ IP blocklist [Block](#)
  - ✓ Geographic restriction [Block](#)
  - ✓ Global rate limit [Count](#)
  - ✓ Body size restriction rule [Count](#)
  - ✓ AWS core rule set [Default](#)
  - ✓ Known bad inputs protection [Default](#)

**You build it**

- Build your own pack from all of the protections AWS WAF offers**: Select and customize rules to fit your needs.
- ✓ You choose which rules to apply

**Add rules**

- Custom rule**: Define custom criteria for web request inspection. Create complex logic with multiple rule statements.
- AWS-managed rule group**: AWS-managed rules protect against web exploits and bot traffic with pre-configured rule groups maintained by security experts.
- AWS Marketplace rule group**: AWS Marketplace rule groups are available by subscription through AWS Marketplace. Each of these rule groups is owned and managed by the AWS Marketplace seller.
- Custom rule group**: Use a rule group to combine rules into a single logical set.

[Cancel](#) [Next](#)

203081517573-a4etx75l.us-east-1.console.aws.amazon.com/wafv2-pro/protections/onboarding?region=us-east-1&panel=onboardingRules&scope=regional

WAF & Shield > Protection packs (web ACLs) > Create protection pack (web ACL)

Find a resource by its name or type

<input type="checkbox"/> Name	Type
<input type="checkbox"/> mini-project-alb	Application Load Balancer

### Choose initial protections

AWS WAF offers various protection packages of WAF rules. AWS WAF rule configurations are based on security best practices. You should validate the rule configurations that are best for you. You can also choose individual rules instead of packages.

**Recommended**

- Recommended rules for you**: Enables recommended rules for the selected application categories and app focus.
- Everything in Essentials**: and the following
  - ✓ Rate limit for GET requests [Count](#)
  - ✓ Rate limit for POST, PUT, DELETE requests [Count](#)

**Essentials**

- Essential rules**: Enables essential rules for the selected application categories and app focus.
  - ✓ Layer 7 anti-DDoS [Default](#)
  - ✓ IP allowlist [Allow](#)
  - ✓ IP blocklist [Block](#)
  - ✓ Geographic restriction [Block](#)
  - ✓ Global rate limit [Count](#)

**You build it**

- Build your own pack from all of the protections AWS WAF offers**: Select and customize rules to fit your needs.
- ✓ You choose which rules to apply

**Add rules**

#### Rule overrides

Override rule group  
This changes the rule group action to Count mode but keeps all individual rule actions unchanged.

**Override all rule actions**

Action	Condition
Block	NoUserAgent_HEADER
Block	UserAgent_BadBots_HEADER
Block	SizeRestrictions_QUERYSTRING
Block	SizeRestrictions_Cookie_HEADER
Block	SizeRestrictions_BODY
Block	SizeRestrictions_URI_PATH
Block	EC2MetaSSRF_BODY
Block	EC2MetaSSRF_COOKIE
Block	EC2MetaSSRF_URI_PATH

[Cancel](#) [Add rule](#)

Screenshot of the AWS WAF & Shield console showing the creation of a protection pack (web ACL). The page displays a list of resources, a section for choosing initial protections, and a rules editor.

**Resources:**

- mini-project-alb (Application Load Balancer)

**Choose initial protections:**

- Recommended:** Recommended rules for you. Enables recommended rules for the selected application categories and app focus.
- Essentials:** Essential rules. Enables essential rules for the selected application categories and app focus.
  - Layer 7 anti-DDoS (Default)
  - IP allowlist (Allow)
  - IP blocklist (Block)
  - Geographic restriction (Block)
  - Global rate limit (Count)
- You build it:** Build your own pack from all of the protections AWS WAF offers. You choose which rules to apply.

**Add rules:**

- AWS-AWSManagedRulesCommonRuleSet (700 WCU)
- AWS-AWSManagedRulesKnownBadInputsRuleSet (200 WCU)
- AWS-AWSManagedRulesAmazonIpReputationList (25 WCU)
- AWS-AWSManagedRulesAnonymousIpList (50 WCU) (Saved)

**Buttons:**

- Add rule
- Edit rule order

Screenshot of the AWS WAF & Shield console showing the successful association of resources to a protection pack and the protection pack details.

**Success message:**

Successfully associated resources to mini-project-waf  
Associating the following resources to mini-project-waf has succeeded:  
mini-project-alb (ARN: arn:aws:elasticloadbalancing:us-east-1:203081517573:loadbalancer/app/mini-project-alb/ae34fd73f1b8ecfc)

**Smart recommendations:**

Based on traffic potential vulnerability, and aggregate data, we will give you tailor made recommendations to stop malicious actors before they attack.

**Protection packs (web ACLs) (1) Info:**

Use protection packs (web ACLs) to combine rules and rule sets that protect your infrastructure from threats.

**Actions:**

- Region scope: CloudFront (Global) and Regional
- Actions: List | Grid
- Protection pack (web ACL): mini-project-waf (4 rules, Manage, View, Not enabled)

**mini-project-waf Details:**

**Description:** Web ACL providing security protection for the mini-project ALB using AWS managed rule groups.

**ARN:** arn:aws:wafv2:us-east-1:4d0b3ee2-0769-4092-a76d-7421110eed66

**Id:** 4d0b3ee2-0769-4092-a76d-7421110eed66

**Actions:**

- Manage details
- Manage rules
- Manage resources
- View dashboard, logs and sampled requests
- Configure logging and sampled requests

## Network ACLs (NACLs)

Created custom public and private NACLs and associated them with the respective subnets to add an extra layer of stateless traffic filtering for inbound and outbound rules.

The screenshot shows the 'Create network ACL' page in the AWS VPC console. The 'Name' field is set to 'mini-project-public-nacl'. The 'VPC' dropdown is set to 'vpc-0c32270a23e57f69c (mini-project-vpc)'. Under 'Tags', there is one tag: 'Name' with value 'mini-project-public-nacl'. The 'Create network ACL' button is at the bottom right.

The screenshot shows the AWS CloudShell interface with various icons and a weather widget indicating 36°F Cloudy. The status bar shows 'ENG IN' and the date '04-12-2025'.

The screenshot shows the 'Edit subnet associations' page for the network ACL 'acl-01d4162026bac5410'. In the 'Available subnets' section, subnets 'public-myproject-01' and 'public-myproject-02' are selected. In the 'Selected subnets' section, the same two subnets are listed. The 'Save changes' button is at the bottom right.

The screenshot shows the AWS CloudShell interface with various icons and a weather widget indicating 36°F Cloudy. The status bar shows 'ENG IN' and the date '04-12-2025'.

203081517573-a4etx75l.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#NetworkAclDetails:networkAclId=acl-01d4162026bac5410

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Network ACLs > acl-01d4162026bac5410 / mini-project-public-nacl

You have successfully updated subnet associations for acl-01d4162026bac5410 / mini-project-public-nacl.

### acl-01d4162026bac5410 / mini-project-public-nacl

**Details** Info

Network ACL ID acl-01d4162026bac5410	Associated with 2 Subnets	Default No	VPC ID vpc-0c32270a23e57f69c / mini-project-vpc
Owner 203081517573			

Inbound rules | Outbound rules | **Subnet associations** | Tags

**Subnet associations (2)**

Name	Subnet ID	Associated with	Availability Zone	IPv4 CIDR	IPv6 CIDR
public-myproject-02	subnet-0a5130f3f4dc21...	acl-01d4162026bac5410 / mini-project...	use1-az2 (us-east-1b)	10.0.2.0/24	-
public-myproject-01	subnet-034f5b731fcdbb...	acl-01d4162026bac5410 / mini-project...	use1-az1 (us-east-1a)	10.0.1.0/24	-

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203081517573-a4etx75l.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#EditInboundRules:networkAclId=acl-01d4162026bac5410

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Network ACLs > acl-01d4162026bac5410 / mini-project-public-nacl > Edit inbound rules

**Edit inbound rules** Info

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

Rule number info	Type info	Protocol info	Port range info	Source info	Allow/Deny info
100	HTTP (80)	TCP (6)	80	0.0.0.0/0	Allow
110	Custom TCP	TCP (6)	1024-65535	0.0.0.0/0	Allow
*	All traffic	All	All	0.0.0.0/0	Deny

Add new rule Sort by rule number Cancel Preview changes Save changes

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#EditInboundRules:networkAclId=acl-01d4162026bac5410

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Network ACLs > acl-01d4162026bac5410 / mini-project-public-nacl > Edit inbound rules

### Edit inbound rules Info

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

Rule number <small>Info</small>	Type <small>Info</small>	Protocol <small>Info</small>	Port range <small>Info</small>	Source <small>Info</small>	Allow/Deny <small>Info</small>
100	HTTP (80)	TCP (6)	80	0.0.0.0/0	Allow
110	Custom TCP	TCP (6)	1026	0.0.0.0/0	Allow
*	All traffic	All	All	0.0.0.0/0	Deny

[Add new rule](#) [Sort by rule number](#)

[Cancel](#) [Preview changes](#) [Save changes](#)

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#NetworkAclDetails:networkAclId=acl-01d4162026bac5410

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Network ACLs > acl-01d4162026bac5410 / mini-project-public-nacl

You have successfully updated inbound rules for acl-01d4162026bac5410 / mini-project-public-nacl

### acl-01d4162026bac5410 / mini-project-public-nacl

[Actions](#)

**Details Info**

Network ACL ID acl-01d4162026bac5410	Associated with 2 Subnets	Default No	VPC ID <a href="#">vpc-0c32270a23e57f69c / mini-project-vpc</a>
Owner 203081517573			

[Inbound rules](#) [Outbound rules](#) [Subnet associations](#) [Tags](#)

**Inbound rules (3)**

Rule number	Type	Protocol	Port range	Source	Allow/Deny
100	HTTP (80)	TCP (6)	80	0.0.0.0/0	Allow
110	Custom TCP	TCP (6)	1026	0.0.0.0/0	Allow
*	All traffic	All	All	0.0.0.0/0	Deny

[Edit inbound rules](#)

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203081517573-a4etx75l.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#EditInboundRules:networkAcldId=acl-01d4162026bac5410

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Network ACLs > acl-01d4162026bac5410 / mini-project-public-nacl > Edit inbound rules

Edit inbound rules [Info](#)

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

Rule number <a href="#">Info</a>	Type <a href="#">Info</a>	Protocol <a href="#">Info</a>	Port range <a href="#">Info</a>	Source <a href="#">Info</a>	Allow/Deny <a href="#">Info</a>
100	HTTP (80)	TCP (6)	80	0.0.0.0/0	Allow <a href="#">Remove</a>
110	Custom TCP	TCP (6)	1024-65535	0.0.0.0/0	Allow <a href="#">Remove</a>
*	All traffic	All	All	0.0.0.0/0	Deny <a href="#">Remove</a>

[Add new rule](#) [Sort by rule number](#)

[Cancel](#) [Preview changes](#) [Save changes](#)

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36°F Cloudy Search ENG IN 10:22 04-12-2025

203081517573-a4etx75l.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#EditOutboundRules:networkAcldId=acl-01d4162026bac5410

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Network ACLs > acl-01d4162026bac5410 / mini-project-public-nacl > Edit outbound rules

Edit outbound rules [Info](#)

Outbound rules control the outgoing traffic that's allowed to leave the VPC.

Rule number <a href="#">Info</a>	Type <a href="#">Info</a>	Protocol <a href="#">Info</a>	Port range <a href="#">Info</a>	Destination <a href="#">Info</a>	Allow/Deny <a href="#">Info</a>
100	HTTP (80)	TCP (6)	80	0.0.0.0/0	Allow <a href="#">Remove</a>
110	HTTPS (443)	TCP (6)	443	0.0.0.0/0	Allow <a href="#">Remove</a>
120	Custom TCP	TCP (6)	1024-65535	0.0.0.0/0	Allow <a href="#">Remove</a>
*	All traffic	All	All	0.0.0.0/0	Deny <a href="#">Remove</a>

[Add new rule](#) [Sort by rule number](#)

[Cancel](#) [Preview changes](#) [Save changes](#)

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#EditOutboundRules:networkAclId=acl-01d4162026bac5410

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Network ACLs > acl-01d4162026bac5410 / mini-project-public-nacl > Edit outbound rules

### Edit outbound rules Info

Outbound rules control the outgoing traffic that's allowed to leave the VPC.

Rule number <small>Info</small>	Type <small>Info</small>	Protocol <small>Info</small>	Port range <small>Info</small>	Destination <small>Info</small>	Allow/Deny <small>Info</small>
100	HTTP (80)	TCP (6)	80	0.0.0.0/0	Allow <button>Remove</button>
110	HTTPS (443)	TCP (6)	443	0.0.0.0/0	Allow <button>Remove</button>
120	Custom TCP	TCP (6)	1024-65535	0.0.0.0/0	Allow <button>Remove</button>
*	All traffic	All	All	0.0.0.0/0	Deny <button>Remove</button>

[Add new rule](#) [Sort by rule number](#)

[Cancel](#) [Preview changes](#) [Save changes](#)

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#NetworkAclDetails:networkAclId=acl-01d4162026bac5410

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Network ACLs > acl-01d4162026bac5410 / mini-project-public-nacl

You have successfully updated outbound rules for acl-01d4162026bac5410 / mini-project-public-nacl

### acl-01d4162026bac5410 / mini-project-public-nacl

[Actions](#)

<b>Details <small>Info</small></b>	<b>Associated with <small>2 Subnets</small></b>	<b>Default <small>No</small></b>	<b>VPC ID <small>vpc-0c32270a23e57f69c / mini-project-vpc</small></b>
Network ACL ID <a href="#">acl-01d4162026bac5410</a>			
Owner <a href="#">203081517573</a>			

Inbound rules [Outbound rules](#) [Subnet associations](#) [Tags](#)

#### Outbound rules (4)

Rule number	Type	Protocol	Port range	Destination	Allow/Deny
100	HTTP (80)	TCP (6)	80	0.0.0.0/0	<span>Allow</span>
110	HTTPS (443)	TCP (6)	443	0.0.0.0/0	<span>Allow</span>
120	Custom TCP	TCP (6)	1024 - 65535	0.0.0.0/0	<span>Allow</span>
*	All traffic	All	All	0.0.0.0/0	<span>Deny</span>

[Edit outbound rules](#)

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36°F Cloudy Search ENG IN 10:27 04-12-2025

203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateNetworkAcl:

Search [Alt+S] Account ID: 2030-8151-7573 United States (N. Virginia) Jaswanth\_mini\_project

VPC > Network ACLs > Create network ACL

### Create network ACL Info

A network ACL is an optional layer of security that acts as a firewall for controlling traffic in and out of a subnet.

#### Network ACL settings

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

mini-project-private-nacl

**VPC**  
VPC to use for this network ACL.

vpc-0c32270a23e57f69c (mini-project-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 mini-project-private-nacl Remove tag

Add tag You can add 49 more tags

Cancel Create network ACL

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37°F Cloudy Search ENG IN 10:40 04-12-2025

203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1>EditNetworkAclSubnetAssociations:networkAclId=acl-09793c38a4a75a062

Search [Alt+S] Account ID: 2030-8151-7573 United States (N. Virginia) Jaswanth\_mini\_project

VPC > Network ACLs > acl-09793c38a4a75a062 / mini-project-private-nacl > Edit subnet associations

### Edit subnet associations Info

Change which subnets are associated with this network ACL.

#### Available subnets (2/4)

Name	Subnet ID	Associated with	Availability Zone	IPv4 CIDR	IPv6 CIDR
public-myproject-01	subnet-034f5b731fcdbbb5a	acl-01d4162026bac5410 / mini...	use1-az1 (us-east-1a)	10.0.1.0/24	-
public-myproject-02	subnet-0a5130f3f4dc219be	acl-01d4162026bac5410 / mini...	use1-az2 (us-east-1b)	10.0.2.0/24	-
private-myproject-01	subnet-04beaade7f37b864e	acl-057f6d93f73c5b99e	use1-az1 (us-east-1a)	10.0.3.0/24	-
private-myproject-02	subnet-09f8c62830bc40ab9	acl-057f6d93f73c5b99e	use1-az2 (us-east-1b)	10.0.4.0/24	-

#### Selected subnets

subnet-04beaade7f37b864e / private-myproject-01 subnet-09f8c62830bc40ab9 / private-myproject-02

Cancel Save changes

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#NetworkAclDetails:networkAclId=acl-09793c38a4a75a062

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Network ACLs > acl-09793c38a4a75a062 / mini-project-private-nacl

You have successfully updated subnet associations for acl-09793c38a4a75a062 / mini-project-private-nacl.

acl-09793c38a4a75a062 / mini-project-private-nacl

**Details** Info

Network ACL ID acl-09793c38a4a75a062	Associated with 2 Subnets	Default No	VPC ID vpc-0c32270a23e57f69c / mini-project-vpc
Owner 203081517573			

Inbound rules | Outbound rules | **Subnet associations** | Tags

**Subnet associations (2)**

Name	Subnet ID	Associated with	Availability Zone	IPv4 CIDR	IPv6 CIDR
private-myproject-01	subnet-04beaade7f37b8...	acl-09793c38a4a75a062 / mini-project...	use1-az1 (us-east-1a)	10.0.3.0/24	-
private-myproject-02	subnet-09f8c62830bc40...	acl-09793c38a4a75a062 / mini-project...	use1-az2 (us-east-1b)	10.0.4.0/24	-

Edit subnet associations

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1>EditInboundRules:networkAclId=acl-09793c38a4a75a062

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

VPC > Network ACLs > acl-09793c38a4a75a062 / mini-project-private-nacl > Edit inbound rules

**Edit inbound rules** Info

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

Rule number	Type	Protocol	Port range	Source	Allow/Deny
100	HTTP (80)	TCP (6)	80	10.0.1.0/24	Allow
110	HTTP (80)	TCP (6)	80	10.0.2.0/24	Allow
120	Custom TCP	TCP (6)	1024-65535	10.0.1.0/24	Allow
130	Custom TCP	TCP (6)	1024-65535	10.0.2.0/24	Allow
*	All traffic	All	All	0.0.0.0/0	Deny

Add new rule Sort by rule number

Cancel Preview changes Save changes

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Screenshot of the AWS VPC Network ACLs page showing the successful update of outbound rules for the mini-project-private-nacl.

**Details Info**

- Network ACL ID: acl-09793c38a4a75a062
- Associated with: 2 Subnets
- Default: No
- VPC ID: [vpc-0c32270a23e57f69c / mini-project-vpc](#)

**Inbound rules** | **Outbound rules** | Subnet associations | Tags

**Outbound rules (4)**

Rule number	Type	Protocol	Port range	Destination	Allow/Deny
100	HTTP (80)	TCP (6)	80	0.0.0.0/0	Allow
110	HTTPS (443)	TCP (6)	443	0.0.0.0/0	Allow
120	Custom TCP	TCP (6)	1024 - 65535	0.0.0.0/0	Allow
*	All traffic	All	All	0.0.0.0/0	Deny

## IAM Role for EC2

Created an IAM role (mini-project-ec2-role) with the necessary permissions and attached it as an instance profile so EC2 can securely access required AWS services.

Screenshot of the AWS IAM Create role page, Step 1: Select trusted entity.

**Select trusted entity**

**Trusted entity type**

- AWS service: Allow AWS services like EC2, Lambda, or others to perform actions in this account.
- AWS account: Allow entities in other AWS accounts belonging to you or a 3rd party to perform actions in this account.
- Web identity: Allows users federated by the specified external web identity provider to assume this role to perform actions in this account.
- SAML 2.0 federation: Allow users federated with SAML 2.0 from a corporate directory to perform actions in this account.
- Custom trust policy: Create a custom trust policy to enable others to perform actions in this account.

**Use case**  
Allow an AWS service like EC2, Lambda, or others to perform actions in this account.

**Service or use case**

**Next**

Screenshot of the AWS IAM 'Create role' wizard - Step 1: Name, review, and create.

**Role details**

**Role name:** mini-project-ec2-role

**Description:** Allows EC2 instances to call AWS services on your behalf.

**Step 1: Select trusted entities**

**Trust policy:**

```
1 - {
2 -   "Version": "2012-10-17",
3 -   "Statement": [
4 -     {
5 -       "Effect": "Allow",
6 -       "Action": [
7 -         "sts:AssumeRole"

```

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Screenshot of the AWS IAM 'Create role' wizard - Step 2: Add permissions.

**Permissions policy summary**

Policy name	Type	Attached as
AmazonEC2ReadOnlyAccess	AWS managed	Permissions policy
AmazonSSMManagedInstanceCore	AWS managed	Permissions policy
CloudWatchAgentServerPolicy	AWS managed	Permissions policy

**Step 3: Add tags**

**Add tags - optional** Tags are key-value pairs that you can add to AWS resources to help identify, organize, or search for resources. No tags associated with the resource.

Add new tag You can add up to 50 more tags.

Cancel Previous Create role

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Screenshot of the AWS IAM Role creation page for 'mini-project-ec2-role'.

**Role mini-project-ec2-role created.**

**mini-project-ec2-role** [Info](#) [Delete](#)

Allows EC2 instances to call AWS services on your behalf.

**Summary**

**Creation date**: December 04, 2025, 14:28 (UTC-05:00)

**ARN**: arn:aws:iam::203081517573:role/mini-project-ec2-role

**Last activity**: -

**Maximum session duration**: 1 hour

**Instance profile ARN**: arn:aws:iam::203081517573:instance-profile/mini-project-ec2-role

**Permissions** **Trust relationships** **Tags** **Last Accessed** **Revoke sessions**

**Permissions policies (3)** [Info](#) [Simulate](#) [Remove](#) [Add permissions](#)

You can attach up to 10 managed policies.

**Filter by Type**: All types

**Policy name**: □ Type: ▲ Attached entities: ▽

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Screenshot of the AWS EC2 Launch Template modification page for 'Modify template (Create new version)'.

**Storage (volumes)** [Info](#)

**Resource tags** [Info](#)

No resource tags are currently included in this template. Add a resource tag to include it in the launch template.

[Add new tag](#)

You can add up to 50 more tags.

**Advanced details** [Info](#)

**IAM instance profile** [Info](#): mini-project-ec2-role (arn:aws:iam::203081517573:instance-profile/mini-project-ec2-role) [Create new IAM profile](#)

**Hostname type** [Info](#): Don't include in launch template

**DNS Hostname** [Info](#):  Enable resource-based IPv4 (A record) DNS requests  Enable resource-based IPv6 (AAAA record) DNS requests

**Instance auto-recovery** [Info](#): Don't include in launch template

**Summary**

**Software Image (AMI)**: Amazon Linux 2023 AMI 2023.9.2... [read more](#) ami-0fa3fe0fa7920f68e

**Virtual server type (instance type)**: t2.micro

**Firewall (security group)**: mini-project-ec2-sg

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

[Cancel](#) [Create template version](#)

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Screenshot of the AWS EC2 Launch Templates page showing a single launch template named "mini-project-lt".

**Launch Templates (1/1) Info**

Launch Template ID	Launch Template Name	Default Version	Latest Version	Create Time	Created By
lt-0e7c63c8182c0ebe4	mini-project-lt	1	2	2025-12-04T13:31:46.000Z	arn:aws:iam::203081517573:user/Jaswanth_miniproject

**mini-project-lt (lt-0e7c63c8182c0ebe4)**

**Launch template details**

Launch template ID lt-0e7c63c8182c0ebe4	Launch template name mini-project-lt	Default version 1	Owner arn:aws:iam::203081517573:user/Jaswanth_miniproject
--	---	----------------------	--

**Details** **Versions** **Template tags**

**Launch template version details**

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Screenshot of the AWS Auto Scaling Groups page showing the configuration for the "mini-project-asg" group.

**Edit Auto Scaling Group**

**Launch template**

For accounts created after May 31, 2023, the EC2 console only supports creating Auto Scaling groups with launch templates. Creating Auto Scaling groups with launch configurations is not recommended but still available via the CLI and API until December 31, 2023.

**Launch template**: mini-project-lt

**Version**: 2

**Description**: -

**AMI ID**: ami-0fa3fe0fa7920f68e

**Key pair name**: -

**Launch template**: mini-project-lt

**Instance type**: t2.micro

**Security groups**: -

**Request Spot Instances**: No

**Security group IDs**: sg-08ccfe5ae7b5a3d77

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https://203081517573-a4etx75l.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:instanceState=running

Instances (4) Info

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4
	i-01ce00572c1bb6fb	Running	t2.micro	Initializing	View alarms +	us-east-1b	-
	i-0bbd2224512ea3365	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	-
	i-0a25398ec19711d60	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	-
	i-01f5ff032e678d830	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1b	-

Select an instance

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https://203081517573-a4etx75l.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#AutoScalingGroups:

Auto Scaling group updated successfully

Auto Scaling groups (1) Info Last updated less than a minute ago

Name	Launch template/configuration	Instances	Status	Desired capacity	Min	Max
mini-project-asg	mini-project-lt   Version 2	5	Updating capacity...	2	2	4

0 Auto Scaling groups selected

Select an Auto Scaling group

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The screenshot shows the AWS EC2 Instances page. The left sidebar is collapsed, and the main area displays a table of instances. The table has columns for Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, and Public IPv4. There are four instances listed, all in the 'Running' state. The instance types are t2.micro. The status check shows '2/2 checks passed' for all. The alarm status is 'View alarms +'. The availability zones are us-east-1a, us-east-1a, and us-east-1b. The public IP column is blank. A search bar at the top allows filtering by attribute or tag. Buttons for 'Connect', 'Instance state', 'Actions', and 'Launch instances' are at the top right.

## NACL Troubleshooting and Fix

Initially, the Auto Scaling Group was failing because the private NACL only allowed subnet-to-subnet traffic, blocking required inbound return traffic for the instances. Using Amazon Q Developer, I identified the missing ephemeral port rules and updated the NACL to allow ports 1024–65535, enabling proper instance communication. After this fix, the Auto Scaling Group stabilized and began launching healthy instances across both Availability Zones.

The screenshot shows the AWS VPC Network ACLs page. The left sidebar shows 'VPC > Network ACLs > acl-09793c38a4a75a062 / mini-project-private-nacl > Edit inbound rules'. The main area displays a table of inbound rules. The table has columns for Rule number, Type info, Protocol info, Port range info, Source info, and Allow/Deny info. There are four rules listed: Rule 90 (HTTP 80), Rule 95 (HTTPS 443), Rule 140 (Custom TCP 1024 - 65535), and All traffic. The All traffic rule is set to Deny. The right side of the screen features the Amazon Q AI developer tool, which provides a 'Bash Script for Setting Up a Basic ...' and a list of rules: Rule #95: ALLOW TCP port 443 from 0.0.0.0/0 (HTTPS from internet) and Rule #140: ALLOW TCP ephemeral ports (1024-65535) from 0.0.0.0/0 (return traffic). It also includes a note about internal-only web servers and a 'Save changes' button.

203081517573-a4etx75.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:instanceState=running

EC2 Instances (2) Info

Last updated less than a minute ago

Find Instance by attribute or tag (case-sensitive)

Instance state = running

Clear filters

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4
	i-00115c0bf018c1cd3	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1b	-
	i-0faa31bcf12f7416	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	-

Select an instance

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16:30 04-12-2025

203081517573-a4etx75.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#TargetGroups:

EC2 Target groups

Target groups (1/1) Info | What's new?

Filter target groups

Name	ARN	Port	Protocol	Target type	Load balancer	VPC ID
mini-project-tg	arn:aws:elasticloadbalancing...	80	HTTP	Instance	mini-project-alb	vpc-0c3227

Target group: mini-project-tg

Total targets	Healthy	Unhealthy	Unused	Initial	Draining
5	0	0	0	0	5

Distribution of targets by Availability Zone (AZ)

Select values in this table to see corresponding filters applied to the Registered targets table below.

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16:30 04-12-2025

203081517573-a4etx75l.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#NetworkAclDetails:networkAclId=acl-09793c38a4a75a062

VPC > Network ACLs > acl-09793c38a4a75a062 / mini-project-private-nacl

**Virtual private cloud**

- Your VPCs
- Subnets
- Route tables
- Internet gateways
- Egress-only internet gateways
- Carrier gateways
- DHCP option sets
- Elastic IPs
- Managed prefix lists
- NAT gateways
- Peering connections
- Route servers

**Security**

- Network ACLs**
- Security groups

**PrivateLink and Lattice**

- Getting started
- Endpoints
- Endpoint services

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Search

Amazon Q

Bash Script for Setting Up a Basic ...

- Your web server can only be accessed from those two specific private subnets
- Internet users cannot reach your web server

Recommended fixes for a public web server:

Add these inbound rules:

- Rule #90: ALLOW TCP port 80 from 0.0.0.0/0 (HTTP from internet)
- Rule #95: ALLOW TCP port 443 from 0.0.0.0/0 (HTTPS from internet)
- Rule #140: ALLOW TCP ephemeral ports (1024-65535) from 0.0.0.0/0 (return traffic)

If this is intentionally a **arnal-only web server**, then your current rules are appropriate for

Ask me anything about AWS

Max 1000 characters

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Search

16:33 04-12-2025

203081517573-a4etx75l.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#NetworkAclDetails:networkAclId=acl-09793c38a4a75a062

VPC > Network ACLs > acl-09793c38a4a75a062 / mini-project-private-nacl

**Virtual private cloud**

- Your VPCs
- Subnets
- Route tables
- Internet gateways
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- Carrier gateways
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**Security**

- Network ACLs**
- Security groups

**PrivateLink and Lattice**

- Getting started
- Endpoints
- Endpoint services

CloudShell Feedback Console Mobile App

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Search

Amazon Q

Bash Script for Setting Up a Basic ...

- Troubleshooting via CloudWatch analyzer
- Looks like I need some more information

I don't know the exact timeframe, so please analyze all Auto Scaling metrics for the last 30 minutes in the current region.

- Troubleshooting via CloudWatch analyzer
- Successfully Analyzed your AWS Autoscalinggroup
- Generated deep insights.
- Found 0 anomalous metrics
- Analysis complete for Auto Scaling
- Found 0 health rule failures

Ask me anything about AWS

Max 1000 characters

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Search

16:33 04-12-2025

203081517573-a4etx75l.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#NetworkAclDetails:networkAclId=acl-09793c38a4a75a062

VPC > Network ACLs > acl-09793c38a4a75a062 / mini-project-private-nacl

**Virtual private cloud**

- Your VPCs
- Subnets
- Route tables
- Internet gateways
- Egress-only internet gateways
- Carrier gateways
- DHCP option sets
- Elastic IPs
- Managed prefix lists
- NAT gateways
- Peering connections
- Route servers

**Security**

- Network ACLs**
- Security groups

**PrivateLink and Lattice**

- Getting started
- Endpoints
- Endpoint services

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**Amazon Q**

Bash Script for Setting Up a Basic ... Why 0.0.0.0/0 fixed it:

- Health Checks Now Allowed

```
ALLOW TCP port 80 from 0.0.0.0/0 # Now a
```

- Complete Traffic Flow

- Load balancer sends health check → ALLOWED by NACL
- Instance responds with HTTP 200 → ALLOWED back through ephemeral ports
- Health check passes - instance marked healthy → ASG happy!

Ask me anything about AWS Max 1000 characters You are using Free Tier, Amazon Q Developer uses generative AI. You may need to verify responses. See the AWS Responsible AI Policy.

203081517573-a4etx75l.us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#AutoScalingGroups:

EC2 > Auto Scaling groups

**Auto Scaling group updated successfully**

**Auto Scaling groups (1) Info** Last updated 5 minutes ago

Name	Launch template/configuration	Instances	Status	Desired capacity	Min	Max
mini-project-asg	mini-project-lt   Version 4	2	-	2	2	4

**Auto Scaling groups selected**

Select an Auto Scaling group

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## Auto Scaling – Dynamic Scaling Policy

Configured a CPU-based target tracking policy that maintains 60% average CPU utilization, automatically scaling EC2 instances out or in based on demand to ensure performance and cost efficiency.

The screenshot shows the 'Create dynamic scaling policy' page in the AWS Management Console. On the left, a sidebar lists various AWS services under 'Auto Scaling'. The main form is titled 'Create dynamic scaling policy' and contains the following fields:

- Policy type:** Target tracking scaling
- Scaling policy name:** cpu-target-tracking
- Metric type:** Average CPU utilization
- Target value:** 60
- Instance warmup:** 300 seconds
- Disable scale in to create only a scale-out policy

At the bottom right are 'Cancel' and 'Create' buttons. The browser address bar shows the URL for creating a dynamic scaling policy for the 'mini-project-asg' Auto Scaling group.

The screenshot shows the 'Capacity overview' page for the 'mini-project-asg' Auto Scaling group. A green success message at the top states: 'Dynamic scaling policy created or edited successfully.' The main section displays the following details:

Desired capacity	Scaling limits (Min - Max)	Desired capacity type	Status
2	2 - 4	Units (number of instances)	-

Below this, the 'Automatic scaling' tab is selected, showing a note about scaling policies resizing the Auto Scaling group. At the bottom, there is a list of 'Dynamic scaling policies' with one item listed.

The browser address bar shows the URL for viewing the scaling details of the 'mini-project-asg' Auto Scaling group.

Screenshot of the AWS CloudWatch Metrics console showing the creation of a CloudWatch Metrics Insights query. The query is named 'cpu-target-tracking' and is set to 'Target tracking scaling'. It triggers actions when Average CPU utilization reaches 60% and adds or removes capacity units as required. The 'Instances need' section specifies a warm-up period of 300 seconds. The 'Scale in' option is enabled.

## CloudWatch Alarms Configuration

I created multiple CloudWatch alarms to monitor the health, performance, and stability of the architecture. These alarms track CPU utilization thresholds, ALB healthy host count, and HTTP 5xx errors. Each alarm triggers an SNS notification, enabling proactive response to performance issues and ensuring high availability.

Screenshot of the AWS CloudWatch Alarms configuration page. A step-by-step wizard is shown for creating a new alarm. Step 1: Specify metric and conditions. Step 2: Configure actions. Step 3: Add alarm details. Step 4: Preview and create. The 'Specify metric and conditions' step is active, showing a graph of CPUUtilization over time. The threshold is set at 70, indicated by a red dashed line. The graph shows values fluctuating between 69 and 71. The 'Metric name' is set to 'CPUUtilization', 'Namespace' to 'AWS/EC2', and 'Statistic' to 'Average'.

Screenshot of the AWS CloudWatch 'Create alarm' wizard - Step 1: Conditions.

**Conditions**

**Threshold type**

Static  
Use a value as a threshold

Anomaly detection  
Use a band as a threshold

**Whenever CPUUtilization is...**  
Define the alarm condition.

Greater  
> threshold

Greater/Equal  
>= threshold

Lower/Equal  
<= threshold

Lower  
< threshold

**than...**  
Define the threshold value.  
70

Must be a number.

**Additional configuration**

Cancel **Next**

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26°F Clear 22:54 ENG IN 04-12-2025

Screenshot of the AWS CloudWatch 'Create alarm' wizard - Step 2: Configure actions.

**Step 2 Configure actions**

Step 3 Add alarm details

Step 4 Preview and create

**Notification**

**Alarm state trigger**  
Define the alarm state that will trigger this action.

In alarm  
The metric or expression is outside of the defined threshold.

OK  
The metric or expression is within the defined threshold.

Insufficient data  
The alarm has just started or not enough data is available.

**Send a notification to the following SNS topic**  
Define the SNS (Simple Notification Service) topic that will receive the notification.

Select an existing SNS topic

Create new topic

Use topic ARN to notify other accounts

**Create a new topic...**  
The topic name must be unique.

Default\_CloudWatch\_Alarms\_Topic

SNS topic names can contain only alphanumeric characters, hyphens (-) and underscores (\_).

**Email endpoints that will receive the notification...**  
Add a comma-separated list of email addresses. Each address will be added as a subscription to the topic above.

jaswanthmatta344@gmail.com

user1@example.com, user2@example.com

**Create topic**

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26°F Clear 22:55 ENG IN 04-12-2025

Screenshot of a Gmail inbox showing an AWS Notification - Subscription Confirmation email.

The email is from AWS Notifications <no-reply@sns.amazonaws.com> to me. It was received at 10:55 PM (0 minutes ago). The subject is "AWS Notification - Subscription Confirmation".

The message content:

You have chosen to subscribe to the topic:  
**arn:aws:sns:us-east-1:203081517573:Default\_CloudWatch\_Alarms\_Topic**

To confirm this subscription, click or visit the link below (If this was in error no action is necessary).  
[Confirm subscription](#)

Please do not reply directly to this email. If you wish to remove yourself from receiving all future SNS subscription confirmation requests please send an email to [sns-opt-out](#).

Below the message are "Reply", "Forward", and "Compose" buttons.

The Gmail sidebar shows the following counts:

- Inbox: 6,650
- Starred: 0
- Snoozed: 0
- Sent: 0
- Drafts: 17
- Purchases: 182
- More: 0

The bottom of the screen shows a Windows taskbar with various pinned icons and system status.

Screenshot of the AWS CloudWatch Metrics console showing the "Create alarm" wizard.

The current step is "Add alarm details".

The "Name and description" section shows:

**Alarm name:** high-cpu-utilization-alarm

**Alarm description - optional:** Triggers when EC2 CPU exceeds 70% for 5 minutes.

A note below states: "Markdown formatting is only applied when viewing your alarm in the console. The description will remain in plain text in the alarm notifications."

The left sidebar shows the steps:

- Step 1: Specify metric and conditions
- Step 2: Configure actions
- Step 3: Add alarm details (highlighted)
- Step 4: Preview and create

The top of the screen shows the AWS CloudWatch Metrics homepage and the "Create alarm" wizard progress bar.

The bottom of the screen shows a Windows taskbar with various pinned icons and system status.

Screenshot of the AWS CloudWatch 'Create alarm' wizard Step 1: Specify metric and conditions.

**Metric**

Graph: This alarm will trigger when the blue line goes above the red line for 1 datapoints within 5 minutes.

No unit: CPUUtilization

Threshold type: Average

Graph visualization:

Namespace: AWS/EC2

Metric name: CPUUtilization

InstanceId: i-0000472ee3f21ad9b

Instance name: No name specified

Statistic: Average

Period: 5 minutes

**Conditions**

Threshold type: Average

**Actions**

Notification: When In alarm, send a notification to "Default\_CloudWatch\_Alarms\_Topic"

**Step 3: Add alarm details**

**Alarm details**

Name: high-cpu-utilization-alarm

Description: Triggers when EC2 CPU exceeds 70% for 5 minutes.

**Tags (0)**

Markdown formatting is only applied when viewing your alarm in the console. The description will remain in plain text in the alarm notifications.

Screenshot of the AWS CloudWatch 'Create alarm' wizard Step 3: Add alarm details.

**Actions**

Notification: When In alarm, send a notification to "Default\_CloudWatch\_Alarms\_Topic"

**Step 3: Add alarm details**

**Alarm details**

Name: high-cpu-utilization-alarm

Description: Triggers when EC2 CPU exceeds 70% for 5 minutes.

**Tags (0)**

Markdown formatting is only applied when viewing your alarm in the console. The description will remain in plain text in the alarm notifications.

**Buttons**

Cancel Previous Create alarm

**System Status Bar**

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The screenshot shows the AWS CloudWatch Alarms page. On the left, there's a sidebar with navigation links like CloudShell, Feedback, and Console Mobile App. The main area has a search bar and a button for creating a new alarm. Below that, a message says "Successfully created alarm high-cpu-utilization-alarm." Another message indicates "Some subscriptions are pending confirmation". The main content area is titled "Alarms (3)" and lists three alarms:

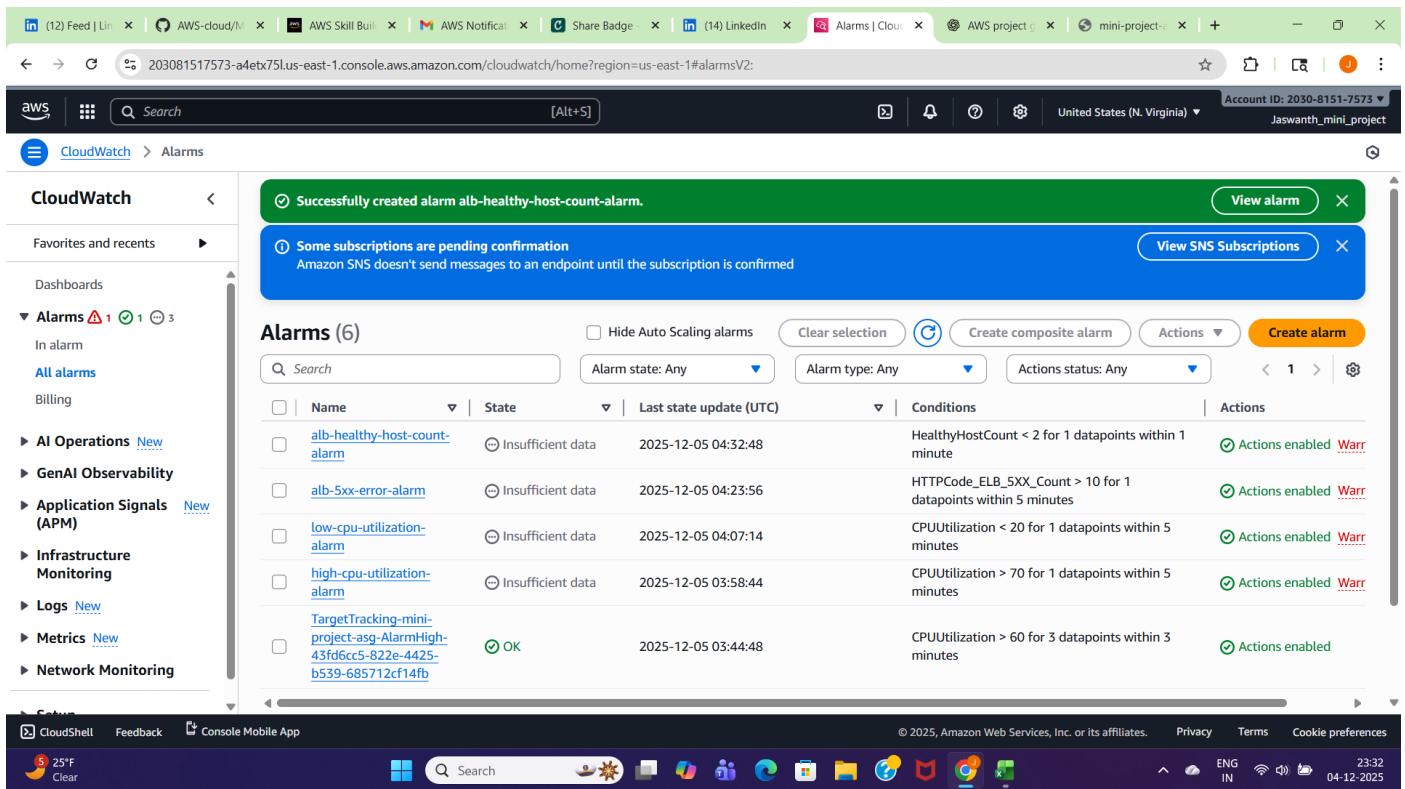
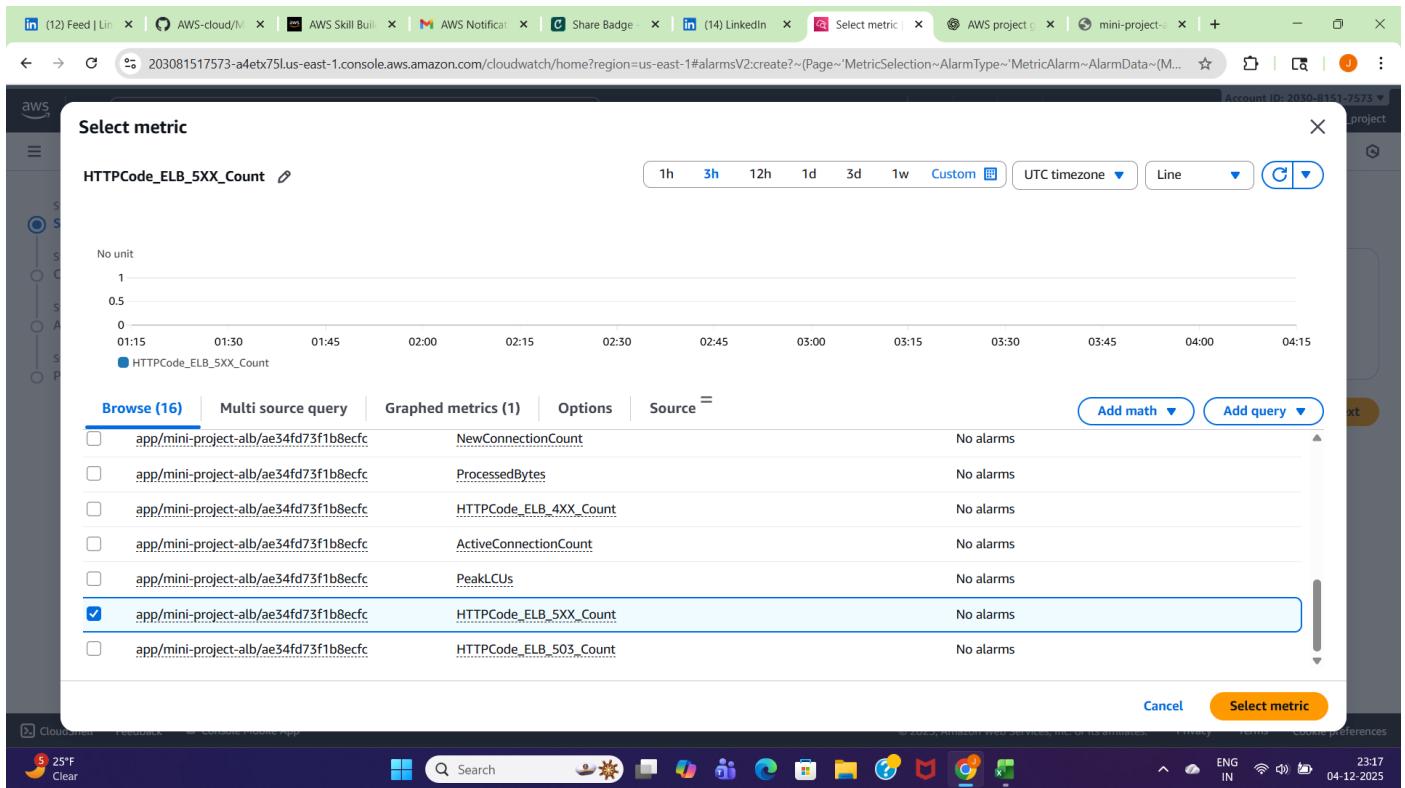
Name	State	Last state update (UTC)	Conditions	Actions
high-cpu-utilization-alarm	Insufficient data	2025-12-05 03:58:44	CPUUtilization > 70 for 1 datapoints within 5 minutes	<span>Actions enabled</span> Warnin
TargetTracking-mini-project-asg-AlarmHigh-43fd6cc5-822e-4425-b539-685712cf14fb	OK	2025-12-05 03:44:48	CPUUtilization > 60 for 3 datapoints within 3 minutes	<span>Actions enabled</span>
TargetTracking-mini-project-asg-AlarmLow-75a9991c-4407-4c9d-a783-0d7781332682	In alarm	2025-12-05 03:44:31	CPUUtilization < 42 for 15 datapoints within 15 minutes	<span>Actions enabled</span>

Screenshot of the AWS CloudWatch Metrics Create alarm page.

The page shows the following configuration:

- Threshold type:** Static (selected)
- Condition:** Whenever CPUUtilization is... Lower < threshold
- Value:** 20
- Period:** Average (5 minutes)

At the bottom, there is a link to "Additional configuration".



## ALB Access Logging Setup

I configured Application Load Balancer access logs by enabling logging, creating a dedicated S3 bucket for log storage, and applying a bucket policy that allows the ALB service to securely deliver log files.

The screenshot shows the 'Create bucket' wizard in the AWS S3 console. The 'General configuration' section is selected. Under 'AWS Region', 'US East (N. Virginia) us-east-1' is chosen. Under 'Bucket type', 'General purpose' is selected, with a note explaining it's recommended for most use cases. The 'Bucket name' field contains 'mini-project-logs-bucket'. The 'Object Ownership' section indicates ownership from other AWS accounts and the use of access control lists (ACLs). A note states that object ownership determines who can specify access to objects.

The screenshot shows the 'Buckets' page in the AWS S3 console. A green success message at the top says 'Successfully created bucket "mini-project-logs-bucket"'. Below it, a table lists eight buckets, including the newly created one. The table columns are 'Name', 'AWS Region', and 'Creation date'. The 'mini-project-logs-bucket' is highlighted with a blue border.

Name	AWS Region	Creation date
food-adiver	US West (Oregon) us-west-2	November 13, 2025, 00:02:14 (UTC-05:00)
jaswanth-voice-bucket	US East (N. Virginia) us-east-1	November 14, 2025, 14:48:44 (UTC-05:00)
<b>mini-project-logs-bucket</b>	US East (N. Virginia) us-east-1	December 4, 2025, 23:39:12 (UTC-05:00)
myagent-1234	US East (N. Virginia) us-east-1	November 14, 2025, 10:27:33 (UTC-05:00)
mybucket-jaswanth	US East (Ohio) us-east-2	October 13, 2025, 10:54:20 (UTC-04:00)
sales-data-0956	US East (N. Virginia) us-east-1	November 13, 2025, 07:54:57 (UTC-05:00)
smart-service-agent-data-jaswanth1	US East (N. Virginia) us-east-1	November 11, 2025, 16:11:48 (UTC-05:00)

This screenshot is identical to the one above, showing the 'Buckets' page with the newly created 'mini-project-logs-bucket' listed in the table.

Screenshot of the AWS EC2 Load Balancers page showing the configuration of a new Application Load Balancer (ALB). The 'Edit load balancer attributes' section is open, specifically the 'Monitoring' tab. Under 'Access logs', the S3 URI is set to 's3://mini-project-logs-bucket'. The 'Save changes' button is highlighted.

Screenshot of the AWS EC2 Load Balancers page showing the configuration of a new Application Load Balancer (ALB). A modal window titled 'Diagnose console errors with Amazon Q' is displayed, indicating an 'Access Denied' error for the bucket 'mini-project-logs-bucket'. The 'Resolution' section provides steps to resolve the issue, including updating the bucket policy. The 'Save changes' button is highlighted.

Screenshot of the AWS CloudWatch Metrics console showing the CloudWatch Metrics Metrics Insights page. The search bar at the top contains "CloudWatch Metrics Metrics Insights". The main content area displays a log entry from "/var/log/syslog" with the following details:

Time	Source	Type	Message
2023-08-15T12:00:00Z	/var/log/syslog	INFO	root@ip-172-31-10-1:~# curl -XPUT https://cloudwatchlogs.us-east-1.amazonaws.com/put-log-events?logStreamName=nginx-access-log-stream&logEvents=[{"timestamp":1692100800000,"logEvent":"[0] 127.0.0.1 - - [15/Aug/2023:12:00:00 +0000] \"GET / HTTP/1.1\" 200 12345\r\n[1]"}]

The bottom of the page shows a summary of metrics and a "View Metrics" button.

Screenshot of the AWS CloudWatch Metrics Metrics Insights page, showing the results of the search query. The results table includes columns for Time, Source, Type, and Message. The first result is identical to the one shown in the previous screenshot.

Screenshot of the AWS CloudWatch Metrics Metrics Insights page, showing the results of the search query. The results table includes columns for Time, Source, Type, and Message. The first result is identical to the one shown in the previous screenshots.

2. Navigate to the S3 console and select the 'mini-project-logs-bucket'

3. Go to the 'Permissions' tab

4. Scroll down to the 'Bucket policy' section and click 'Edit'

5. Review the existing bucket policy for any invalid principals. Look for:

- o Malformed ARNs
- o Non-existent AWS accounts or IAM users/roles
- o Incorrect service principals

6. If you find any invalid principals, correct them. For example:

- o Replace incorrect ARNs with valid ones
- o Remove or update non-existent principals
- o Ensure service principals are correctly formatted (e.g. 's3.amazonaws.com' for S3)

7. If you're unsure about the correct principal, consider using the ARN of the IAM user trying to access the bucket:

```
"Principal": {  
    "AWS": "arn:aws:iam::203081517573:user/Jaswanth_mini_project"  
}
```

8. Ensure that the policy structure is correct, with valid JSON syntax

9. After making the necessary corrections, click 'Save changes'

10. Test the access to the bucket to ensure the error has been resolved

11. If the error persists, review the bucket's access control list (ACL) and ownership settings to ensure they're not conflicting with the bucket policy

Is this resolution helpful?

Use of Amazon Q is subject to the [AWS Responsible AI Policy](#). Outputs should be evaluated for accuracy and appropriateness for your use case.

Cancel Save changes

203081517573-a4etx75l.us-east-1.console.aws.amazon.com/s3/buckets/mini-project-logs-bucket?region=us-east-1&tab=permissions

Amazon S3 > Buckets > mini-project-logs-bucket

### Bucket policy

The bucket policy, written in JSON, provides access to the objects stored in the bucket. Bucket policies don't apply to objects owned by other accounts. [Learn more](#)

**Public access is blocked because Block Public Access settings are turned on for this bucket**  
To determine which settings are turned on, check your Block Public Access settings for this bucket. Learn more about [using Amazon S3 Block Public Access](#)

```
{  
    "Version": "2012-10-17",  
    "Statement": [  
        {  
            "Sid": "AWSALBLogsDelivery",  
            "Effect": "Allow",  
            "Principal": {  
                "Service": "logdelivery.elasticloadbalancing.amazonaws.com"  
            },  
            "Action": "s3:PutObject",  
            "Resource": "arn:aws:s3:::mini-project-logs-bucket/alb-logs/AWSLogs/203081517573/*",  
            "Condition": {  
                "StringEquals": {  
                    "s3:x-amz-acl": "bucket-owner-full-control"  
                }  
            }  
        },  
        {  
            "Sid": "AWSALBLogsBucketAclCheck",  
            "Effect": "Allow",  
            "Principal": "AWSALBLogsDelivery"  
        }  
    ]  
}
```

Copy

Edit Delete

CloudShell Feedback Console Mobile App

Screenshot of the AWS CloudWatch Metrics console showing the CloudWatch Metrics dashboard for the 'mini-project' log group. The dashboard displays various metrics related to CloudWatch Metrics, such as Log Events, Metrics, and Metrics Insights.

**CloudWatch Metrics Dashboard**

- Log Events:** Shows log events from the 'mini-project' log group. It includes a search bar and a table with columns: @version, @timestamp, @source, @log\_group\_name, and @message.
- Metrics:** Shows metrics from the 'mini-project' log group. It includes a search bar and a table with columns: Metric Name, Unit, and Value.
- Metrics Insights:** Shows insights for metrics from the 'mini-project' log group. It includes a search bar and a table with columns: Metric Name, Unit, and Value.

**Navigation:** EC2 > Load balancers > mini-project-alb

**Configuration Options:**

- Packet handling:**
  - Desync mitigation mode: Defensive
  - Drop invalid header fields: Off
  - X-Forwarded-For header: Append
  - Client port preservation: Off
- Availability Zone routing configuration:**
  - Cross-zone load balancing: On
  - ARC zonal shift integration: Disabled
- Protection:**
  - Deletion protection: Off
- Monitoring:**
  - Access logs: S3 location: mini-project-logs-bucket/alb-logs/
  - Connection logs: Off
  - Health check logs - new: Off

## CloudFront Distribution Setup

Configured CloudFront to sit in front of the ALB for faster global delivery and improved performance through edge caching.

Screenshot of the AWS CloudFront Distribution creation wizard, Step 1: Get started.

**Get started**

Choose your websites, apps, files, video streams, and other content to CloudFront. We optimize the performance, reliability, and security for your web traffic.

**Distribution options**

**Distribution name:** mini-project-cloudfront

**Description - optional:** CloudFront distribution for mini-project ALB

**Distribution type:**

- Single website or app** (selected): Choose if each website or application will have a unique configuration.
- Multi-tenant architecture - New**: Choose when you have multiple domains that need to share configurations. This is a common architecture for SaaS providers.

**Domain**

**Route 53 managed domain - optional:** Enter a domain that's already registered with Route 53 in your AWS account. CloudFront will provision a TLS certificate for you. If you have a domain from a different DNS provider, skip this step and configure your domain later.

**Navigation:** CloudFront > Distributions > Create distribution

The screenshot shows the AWS CloudFront 'Create distribution' wizard at the 'Specify origin' step. The left sidebar lists steps: Step 2 (Get started), Step 3 (Specify origin, highlighted in blue), Step 4 (Enable security), Step 5 (Review and create). The main content area is titled 'Origin type' and describes CloudFront's support for AWS-based origins and other cloud providers. It lists five options: Amazon S3, Elastic Load Balancer (selected), API Gateway, Elemental MediaPackage, and VPC origin. Each option has a brief description.

Step 2  
Get started

Step 3  
**Specify origin**

Step 4  
Enable security

Step 5  
Review and create

**Origin type**  
Your origin is where your content (such as a website or app) lives. CloudFront works with AWS-based origins and origins hosted on other cloud providers.

**Origin type**

**Elastic Load Balancer**  
Deliver applications hosted behind ELB such as dynamic websites, web services, and APIs.

**Amazon S3**  
Deliver static assets like files and images, statically generated websites or single page applications (SPA).

**Elemental MediaPackage**  
Deliver end-to-end live events or video on demand (VOD).

**VPC origin**  
Deliver applications and content hosted within private VPCs, such as EC2 instances and Application Load Balancers.

**API Gateway**  
Deliver API endpoints for REST APIs hosted on API Gateway.

**Other**  
Refer to any AWS or non-AWS origin through its publicly resolvable URL.

**Origin**

**Elastic Load Balancing origin**

Choose an AWS origin, or enter your origin's domain name. [Learn more](#)

[Browse load balancers](#)

**Origin path - optional**

The directory path within your origin where your content is stored. [Learn more](#)

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CloudFront > Distributions > Create distribution

Step 2  
Get started

Step 3  
Specify origin

Step 4  
Enable security

Step 5  
**Review and create**

### General configuration

Distribution name	mini-project-cloudfront	Description	CloudFront distribution for mini-project ALB	Billing	Free (\$0/month)	Today's pro-rated charge (estimate)	\$0
-------------------	-------------------------	-------------	--	---------	------------------	-------------------------------------	-----

### Origin

Elastic Load Balancing origin	mini-project-alb-1663545100.us-east-1.elb.amazonaws.com	Origin path	-	Grant CloudFront access to origin	No	Enable Origin Shield	No
Connection attempts	3	Connection timeout	10				

### Cache settings

CloudFront will apply default cache settings tailored to serving content from a Elastic Load Balancing origin. You can customize settings after you create your distribution.

### Security

Security protections	Use monitor mode
----------------------	------------------

Screenshot of the AWS CloudFront distribution creation page. A green success message box at the top says "Successfully created new distribution." Below it, the distribution name "mini-project-cloudfront" is shown with a "Free plan" badge. The "Details" section includes fields for "Distribution domain name" (d2g35o61n4sojv.cloudfront.net), "Billing" (Free plan (\$0/month)), "ARN" (arn:aws:cloudfront::203081517573:distribution/EET7AU1VLTFKJ), and "Last modified" (Deploying). Below this, tabs for "General", "Security", "Origins", "Behaviors", "Error pages", "Invalidations", "Logging" (selected), and "Tags" are visible. The "Settings" section contains fields for "Name" (mini-project-cloudfront), "Description" (CloudFront distribution for mini-project ALB), and "Price class" (Use all edge locations (best performance)). It also includes sections for "Alternate domain names" (with an "Add domain" button) and "Standard logging" (Available with the Pro plan). The browser status bar shows the URL https://203081517573-a4etx75l.us-east-1.console.aws.amazon.com/cloudfront/v4/home?region=us-east-1#/distributions/EET7AU1VLTFKJ/logging.

## S3 Lifecycle Policy

Configured lifecycle rules to automatically transition log files to cheaper storage tiers (Standard-IA → Glacier tiers) and expire them after 1 year to optimize long-term storage costs.

Screenshot of the AWS S3 management console showing the creation of a lifecycle rule for the "mini-project-logs-bucket". The "Create lifecycle rule" page has a "Lifecycle rule configuration" section. The "Lifecycle rule name" is "log-storage-optimization". The "Filter type" section indicates "Limit the scope of this rule using one or more filters" (radio button selected). The "Prefix" field contains "alb-logs/". The "Object tags" section says "You can limit the scope of this rule to the key/value pairs added below." A "Add tag" button is present. The browser status bar shows the URL https://203081517573-a4etx75l.us-east-1.console.aws.amazon.com/s3/management/mini-project-logs-bucket/lifecycle/create?region=us-east-1.

203081517573-a4etx75.us-east-1.console.aws.amazon.com/s3/management/mini-project-logs-bucket/lifecycle/create?region=us-east-1

Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

Amazon S3 > Buckets > mini-project-logs-bucket > Lifecycle configuration > Create lifecycle rule

### Lifecycle rule actions

Choose the actions you want this rule to perform.

Transition current versions of objects between storage classes  
This action will move current versions.

Transition noncurrent versions of objects between storage classes  
This action will move noncurrent versions.

Expire current versions of objects

Permanently delete noncurrent versions of objects

Delete expired object delete markers or incomplete multipart uploads  
These actions are not supported when filtering by object tags or object size.

**⚠️ Transitions are charged per request**  
For a lifecycle transition action, each request corresponds to an object transition. For details on lifecycle transition pricing, see requests pricing info on the [Storage & requests tab of the Amazon S3 pricing page](#).  
 I acknowledge that this lifecycle rule will incur a transition cost per request.

**ⓘ By default, objects less than 128KB will not transition across any storage class**  
We don't recommend transitioning objects less than 128 KB because the transition costs can outweigh the storage savings. If your use case requires transitioning objects less than 128 KB, specify a minimum object size filter for each applicable lifecycle rule with a transition action.

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/s3/management/mini-project-logs-bucket/lifecycle/create?region=us-east-1

Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

Amazon S3 > Buckets > mini-project-logs-bucket > Lifecycle configuration > Create lifecycle rule

We don't recommend transitioning objects less than 128 KB because the transition costs can outweigh the storage savings. If your use case requires transitioning objects less than 128 KB, specify a minimum object size filter for each applicable lifecycle rule with a transition action.

### Transition current versions of objects between storage classes

Choose transitions to move current versions of objects between storage classes based on your use case scenario and performance access requirements. These transitions start from when the objects are created and are consecutively applied. [Learn more](#)

**Choose storage class transitions**

Storage Class	Days after object creation	Action
Standard-IA	30	<input type="button" value="Remove"/>
Glacier Instant Retrieval	60	<input type="button" value="Remove"/>
Glacier Deep Archive	180d	<input type="button" value="Remove"/>

### Expire current versions of objects

For version-enabled buckets, Amazon S3 adds a delete marker and the current version of an object is retained as a noncurrent version. For non-versioned buckets, Amazon S3 permanently removes the object. [Learn more](#)

**Days after object creation**

Enter number of days

Expiration is required for the selected action. Enter a value or deselect the action.

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/s3/management/mini-project-logs-bucket/lifecycle/create?region=us-east-1

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

Amazon S3 > Buckets > mini-project-logs-bucket > Lifecycle configuration > Create lifecycle rule

REVIEW TRANSITION AND EXPIRATION ACTIONS

**Current version actions**

**Day 0**

- Objects uploaded

↓

**Day 30**

- Objects move to Standard-IA

↓

**Day 60**

- Objects move to Glacier Instant Retrieval

↓

**Day 180**

- Objects move to Glacier Deep Archive

↓

**Day 365**

- Objects expire

**Noncurrent versions actions**

**Day 0**

No actions defined.

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203081517573-a4etx75.us-east-1.console.aws.amazon.com/s3/management/mini-project-logs-bucket/lifecycle?region=us-east-1

aws Search [Alt+S] United States (N. Virginia) Account ID: 2030-8151-7573 Jaswanth\_mini\_project

Amazon S3 > Buckets > mini-project-logs-bucket > Lifecycle configuration

The rule "log-storage-optimization" has been successfully added and the lifecycle configuration has been updated. It may take some time for the configuration to be updated. Refresh the lifecycle rules list if changes to the configuration aren't displayed.

## Lifecycle configuration

To manage your objects so that they are stored cost effectively throughout their lifecycle, configure their lifecycle. A lifecycle configuration is a set of rules that define actions that Amazon S3 applies to a group of objects. Lifecycle rules run once per day.

**Default minimum object size for transitions**  
All storage classes 128K

**Lifecycle rules (1)**

Use lifecycle rules to define actions you want Amazon S3 to take during an object's lifetime such as transitioning objects to another storage class, archiving them, or deleting them after a specified period of time. [Learn more](#)

Lifecycle rule name	Status	Scope	Current version actions	Noncurrent version actions	Expired object delete actions	Incomplete multipart upload actions
log-storage-optimization	Enabled	Filtered	Transition to Standard-IA, th	-	-	-

View details Edit Actions Create lifecycle rule

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## CloudFront Behavior Configuration

Configured default behavior to route all requests to the ALB origin, enforce HTTPS for security, and enable compression to improve performance and reduce bandwidth usage.

The screenshot shows the 'Edit behavior' configuration page for a CloudFront distribution. Under the 'Settings' tab, the 'Path pattern' is set to 'Default (\*)' and the 'Origin and origin groups' is set to 'mini-project-alb-1663545100.us-east-1.elb.amazonaws.com-mises2zevit'. The 'Compress objects automatically' option is selected ('Yes'). In the 'Viewer' section, the 'Viewer protocol policy' is set to 'Redirect HTTP to HTTPS', and the 'Allowed HTTP methods' include 'GET, HEAD, OPTIONS'. The bottom of the screen shows a Windows taskbar with various icons and a weather widget indicating 20°F and mostly sunny.

The screenshot shows the 'Edit behavior' configuration page for a CloudFront distribution. Under the 'Restrict viewer access' section, the 'No' option is selected. In the 'Cache key and origin requests' section, there is a note about using a cache policy and origin request policy. A callout box for 'Custom cache policies' is shown, with a link to 'Upgrade to Business →'. Under 'Cache policy', the 'CachingOptimized' policy is selected. In the 'Origin request policy - optional' section, the 'AllViewerExceptHostHeader' policy is selected. The 'Response headers policy - optional' section is currently empty. The bottom of the screen shows a Windows taskbar with various icons and a weather widget indicating 20°F and mostly sunny.

Screenshot of the AWS CloudFront distribution configuration page. The distribution is named "mini-project-cloudfront" and is in a "Free plan". The "Behaviors" tab is selected, showing one behavior rule:

Preced...	Path pattern	Origin or origin group	Viewer protocol policy	Cache policy name	Origin request policy na...	Response headers policy...
0	Default (*)	mini-project-alb-166354...	Redirect HTTP to HTTPS	Managed-CachingOptimized	Managed-AllViewerExceptHost	Managed-SecurityHeadersPoli

The browser status bar shows the URL: 20308151753-a4etx75.us-east-1.console.aws.amazon.com/cloudfront/v4/home?region=us-east-1#/distributions/EET7AU1VLTFKJ/behaviors.

Screenshot of a browser window showing a 504 Gateway Timeout error. The URL is d2g35o61n4sojv.cloudfront.net.

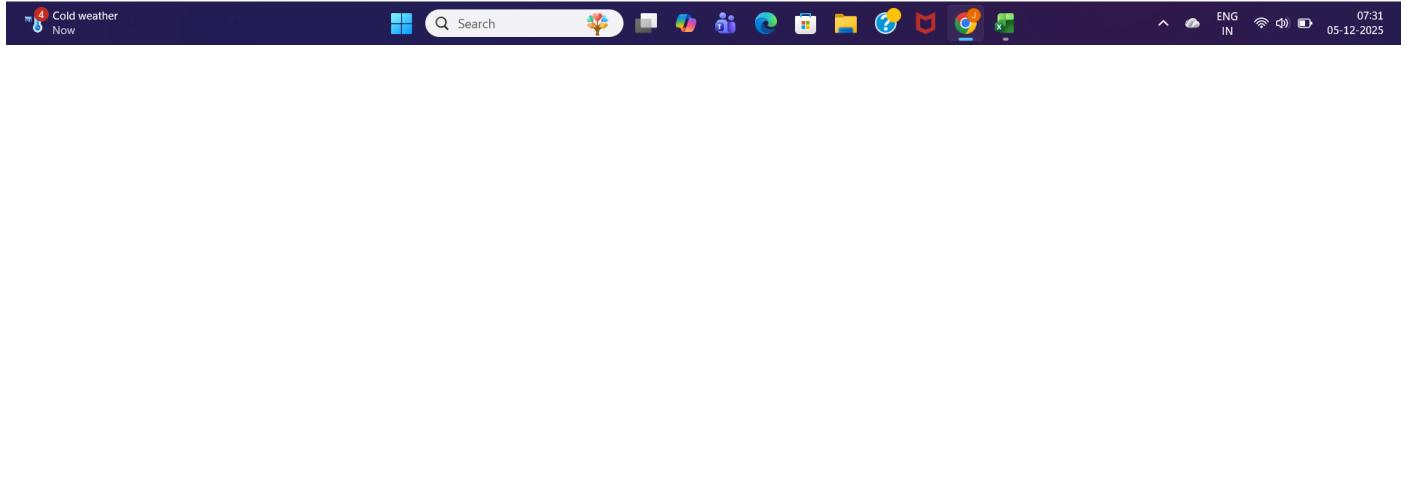
## 504 Gateway Timeout ERROR

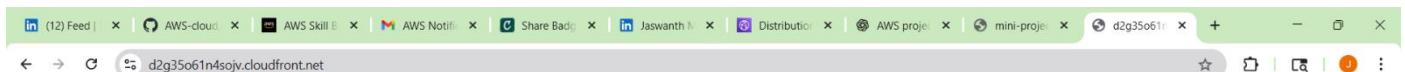
**The request could not be satisfied.**

We can't connect to the server for this app or website at this time. There might be too much traffic or a configuration error. Try again later, or contact the app or website owner. If you provide content to customers through CloudFront, you can find steps to troubleshoot and help prevent this error by reviewing the CloudFront documentation.

Generated by cloudfront (CloudFront) HTTP3 Server  
Request ID: ZqktJvxAovR4FIAwPP4PL7qh290UhNmt8aYb9HNp4724\_aDvrrGmVQ==

The browser status bar shows the URL: d2g35o61n4sojv.cloudfront.net.





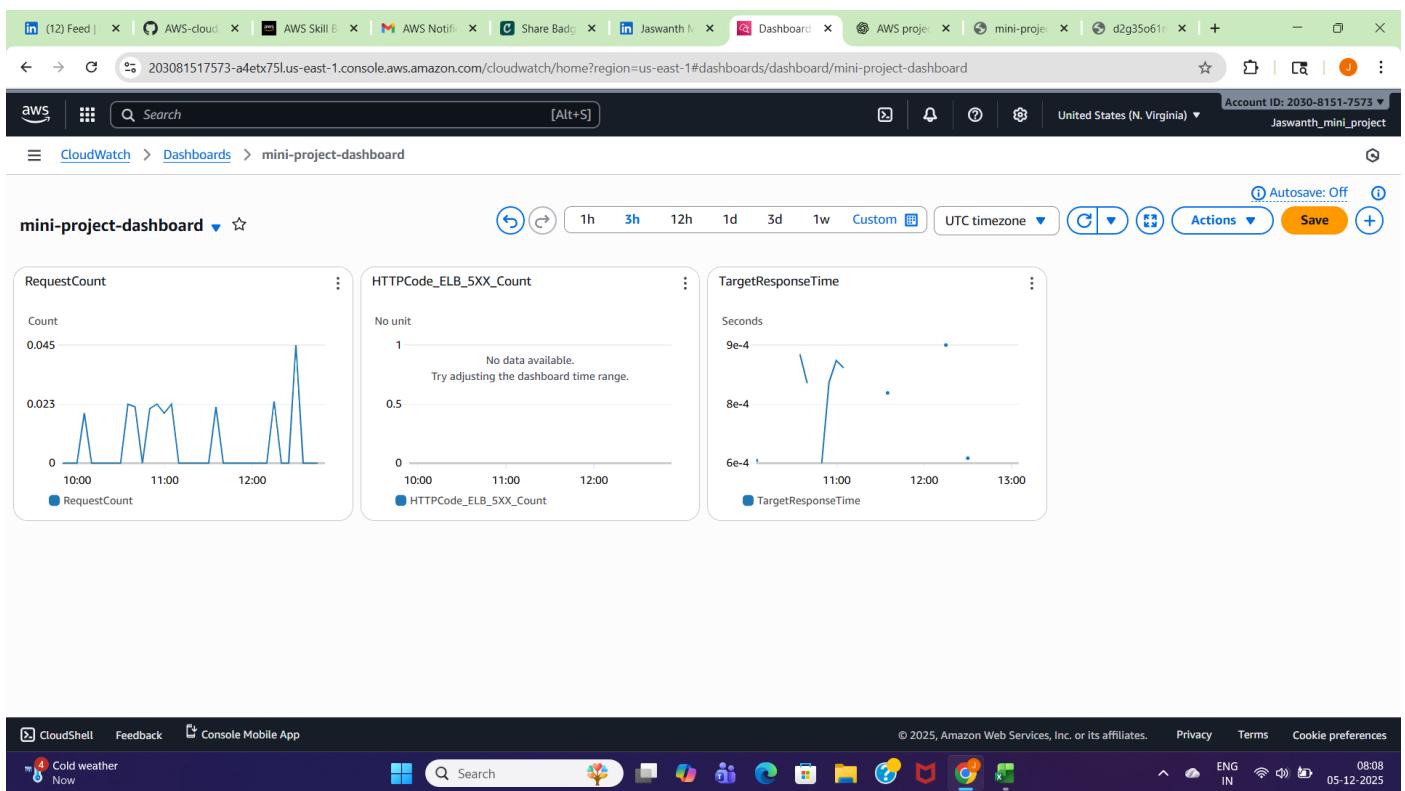
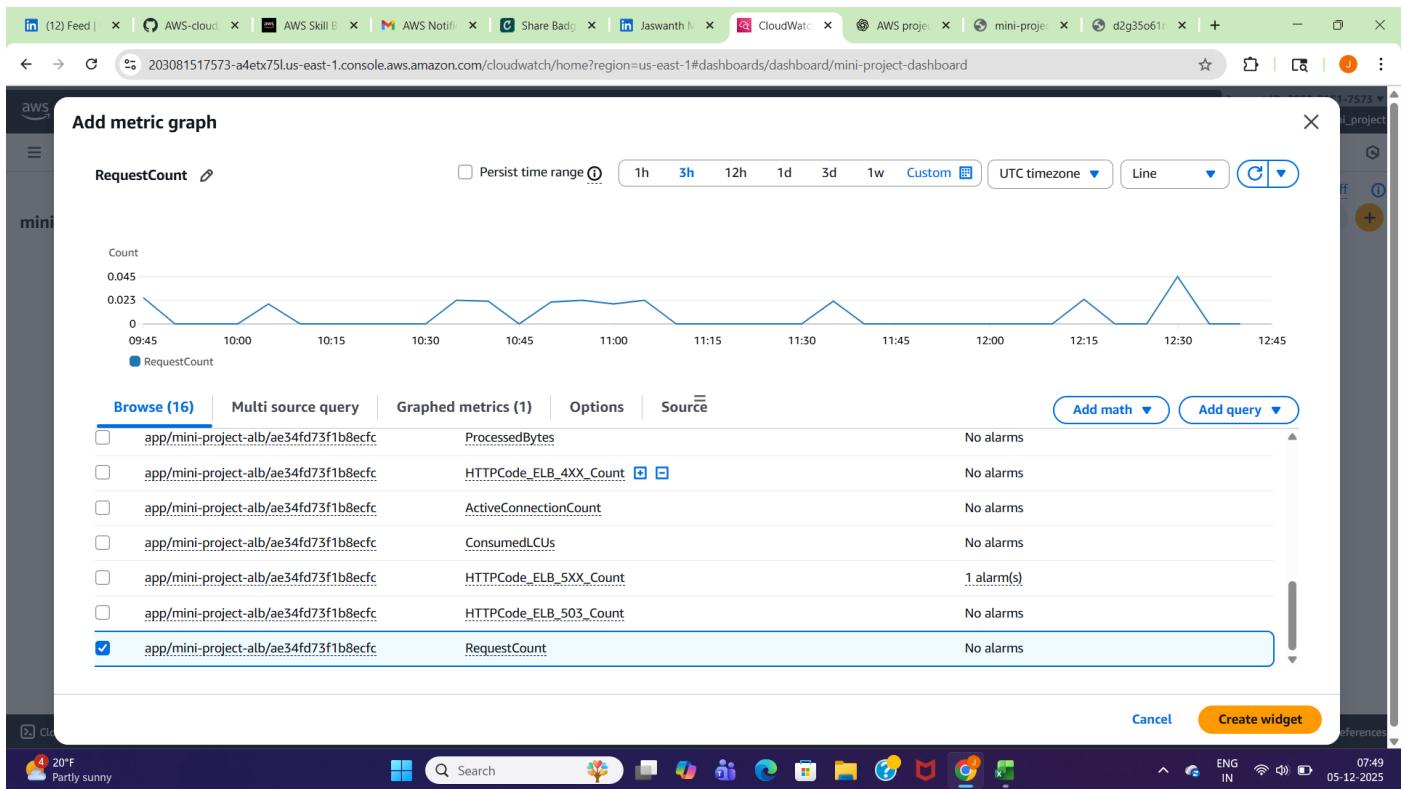
## Welcome to Mini Project Web Server - ip-10-0-3-199.ec2.internal



## CloudWatch Monitoring Dashboard

Built a custom CloudWatch dashboard to monitor key metrics such as request count, error rates, response time, CPU utilization, and healthy host count for real-time visibility into application performance.

The screenshot shows the AWS CloudWatch Metrics Dashboard configuration interface. A modal window titled "Add widget" is open, prompting the user to select a data source type and a widget type. The "Data sources types" section includes options for Cloudwatch, Other content types, and Create data sources. The "Widget Configuration" section has a "Metrics" tab selected, showing various visualization options: Line (selected), Data table, Number, Gauge, Stacked area, and Bar. Each option includes a brief description and a small preview icon. At the bottom of the modal are "Cancel" and "Next" buttons. The background shows the AWS CloudWatch Metrics Dashboard with a navigation bar and a list of dashboards.



The screenshot shows the AWS CloudWatch Metrics Dashboard for the 'mini-project-dashboard'. The top navigation bar includes tabs for AWS Feed, AWS Skill, AWS Notify, Share Badges, Jaswanth M, Dashboard, AWS projects, mini-project, d2g35o61r, and a plus sign. The URL in the address bar is 203081517573-a4etx75l.us-east-1.console.aws.amazon.com/cloudwatch/home?region=us-east-1#dashboards/dashboard/mini-project-dashboard. The dashboard header features the AWS logo, a search bar with placeholder 'Search' and an 'Alt+S' keyboard shortcut, and account information for Account ID: 2030-8151-7573 and Region: United States (N. Virginia). Below the header, the breadcrumb navigation shows 'CloudWatch > Dashboards > mini-project-dashboard'. The main content area contains four metric cards:

- RequestCount**: A line chart showing the count of requests over time. The Y-axis ranges from 0 to 0.045. The X-axis shows times from 10:00 to 13:00. A single data point is plotted at approximately 11:30 AM with a value of about 0.045.
- HTTPCode\_ELB\_5XX\_Count**: A line chart showing the count of 5XX errors over time. The Y-axis ranges from 0 to 0.5. The X-axis shows times from 10:00 to 12:00. The chart displays the message "No data available. Try adjusting the dashboard time range."
- TargetResponseTime**: A line chart showing the target response time in seconds over time. The Y-axis ranges from 6e-4 to 9e-4. The X-axis shows times from 10:00 to 13:00. A single data point is plotted at approximately 11:15 AM with a value of about 9e-4.
- HealthyHostCount**: A line chart showing the count of healthy hosts over time. The Y-axis ranges from 1 to 3. The X-axis shows times from 10:00 to 13:00. The chart shows a constant value of 3.

On the right side of the dashboard, there are various controls: a refresh icon, time range selection (1h, 3h, 12h, 1d, 3d, 1w, Custom), UTC timezone dropdown, a 'Save' button, and an 'Actions' dropdown menu.

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The screenshot shows the AWS CloudWatch Metrics Dashboard titled "mini-project-dashboards". The dashboard displays several metrics over a time range from 10:00 to 13:00. The metrics include:

- CPUUtilization**: A line chart showing CPU utilization fluctuating between 0.382 and 0.435 percent.
- RequestCount**: A line chart showing request counts peaking at approximately 0.023 around 11:00.
- HTTPCode\_ELB\_5XX\_Count**: A line chart showing HTTP 5XX error counts near zero.
- TargetResponseTime**: A line chart showing response times with a sharp spike reaching 8e-4 at 11:00.
- HealthyHostCount**: A line chart showing the count of healthy hosts, which is consistently at 2.

The dashboard interface includes a search bar, navigation links for CloudWatch and Dashboards, and a save button. The top navigation bar shows the URL as 203081517573-a4etx75l.us-east-1.console.aws.amazon.com/cloudwatch/home?region=us-east-1#dashboards/dashboard/mini-project-dashboard.

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## **Key Components (Short bullets)**

- Networking: VPC, public/private subnets, Internet Gateway, NAT Gateway, route tables
- Security: ALB security groups, EC2 SG, custom NACLs, IAM role for EC2, AWS WAF on ALB
- Compute & Scaling: Launch Template + Auto Scaling Group with CPU Target Tracking
- Load Balancing: Highly available Application Load Balancer with health checks
- Monitoring: CloudWatch alarms, SNS notifications, and custom performance dashboard
- S3 Logging: Centralized ALB access logs with lifecycle rules (IA → Glacier → Deep Archive → Expire)
- Content Delivery: CloudFront distribution integrated with ALB + HTTPS redirect
- Troubleshooting: Fixed ASG loop by correcting NACL inbound rules using Amazon Q Developer

## **Outcome**

This setup mimics a real-world production architecture, demonstrating strong skills in AWS networking, security, scalability, monitoring, and operational excellence.