

AWS Three Tier GitHub - iamto Console Home Dashboard | IAM | Global RDS | us-east- subnets | VPC GitHub - aws- AWS Thre X + V - X

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AWS Three Tier Web Architecture X

AWS Three Tier Web Architecture > Part 0: Setup

Part 0: Setup

For this workshop, we will be downloading the code from Github and upload it to S3 so our instances can access it. We will also create an AWS Identity and Access Management EC2 role so we can use AWS Systems Manager Session Manager to connect to our instances securely and without needing to create SSH key pairs.

Learning Objectives:

- S3 Bucket Creation
- IAM EC2 Instance Role Creation
- Download Code from Github Repository

Previous Next

```
MINGW64:/c/Users/ASUS/Downloads/3tier
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads
$ pwd
/c/Users/ASUS/Downloads
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads
$ mkdir 3tier
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads
$ cd 3tier/
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier
$ git clone https://github.com/aws-samples/aws-three-tier-web-architecture-workshop.git
```

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AWS Three Tier Web Architecture > ... > Download Code from Github

Download Code from Github

Download the code from [this repository](https://github.com/aws-samples/aws-three-tier-web-architecture-workshop) into your local environment by running the command below. If you don't have git installed, you can just download the zip. Save it somewhere you can easily access.

```
1 git clone https://github.com/aws-samples/aws-three-tier-web-architecture-workshop
```

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```
MINGW64:/c/Users/ASUS/Downloads/3tier/aws-three-tier-web-architecture-workshop
```

```
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads
```

```
$ pwd
```

```
/c/Users/ASUS/Downloads
```

```
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads
```

```
$ mkdir 3tier
```

```
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads
```

```
$ cd 3tier/
```

```
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier
```

```
$ git clone https://github.com/aws-samples/aws-three-tier-web-architecture-wor  
kshop.git
```

```
Cloning into 'aws-three-tier-web-architecture-workshop'...
```

```
remote: Enumerating objects: 133, done.
```

```
remote: Counting objects: 100% (20/20), done.
```

```
remote: Compressing objects: 100% (10/10), done.
```

```
remote: Total 133 (delta 14), reused 10 (delta 10), pack-reused 113
```

```
Receiving objects: 100% (133/133), 230.74 KiB | 699.00 KiB/s, done.
```

```
Resolving deltas: 100% (52/52), done.
```

```
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier
```

```
$ ls -lrt
```

```
total 4  
drwxr-xr-x 1 ASUS 197121 0 Nov 26 10:14 aws-three-tier-web-architecture-workshop/
```

```
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier
```

```
$ cd aws-three-tier-web-architecture-workshop/
```

```
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier/aws-three-tier-web-architecture-workshop (main)
```

```
$ ls -rlt
```

```
total 13
```

```
-rw-r--r-- 1 ASUS 197121 313 Nov 26 10:14 CODE_OF_CONDUCT.md
```

```
-rw-r--r-- 1 ASUS 197121 3219 Nov 26 10:14 CONTRIBUTING.md
```

```
-rw-r--r-- 1 ASUS 197121 2045 Nov 26 10:14 README.md
```

```
-rw-r--r-- 1 ASUS 197121 942 Nov 26 10:14 LICENSE
```

```
drwxr-xr-x 1 ASUS 197121 0 Nov 26 10:14 application-code/
```

```
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier/aws-three-tier-web-architecture-workshop (main)
```

```
$ |
```



```
Type here to search
```



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```
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier  
$ cd aws-three-tier-web-architecture-workshop/
```

```
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier/aws-three-tier-web-architecture-workshop  
$ ls -rlt  
total 13  
-rw-r--r-- 1 ASUS 197121 313 Nov 26 10:14 CODE_OF_CONDUCT.md  
-rw-r--r-- 1 ASUS 197121 3219 Nov 26 10:14 CONTRIBUTING.md  
-rw-r--r-- 1 ASUS 197121 2045 Nov 26 10:14 README.md  
-rw-r--r-- 1 ASUS 197121 942 Nov 26 10:14 LICENSE  
drwxr-xr-x 1 ASUS 197121 0 Nov 26 10:14 application-code/
```

```
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier/aws-three-tier-web-architecture-workshop  
$ cd application-code/
```

```
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier/aws-three-tier-web-architecture-workshop  
$ ls -lrt  
total 8  
drwxr-xr-x 1 ASUS 197121 0 Nov 26 10:14 app-tier/  
-rw-r--r-- 1 ASUS 197121 2590 Nov 26 10:14 nginx.conf  
drwxr-xr-x 1 ASUS 197121 0 Nov 26 10:14 web-tier/
```

```
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier/aws-three-tier-web-architecture-workshop  
$
```



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aws | Services | Search [Alt+S] | | Global | Subham Pradhan |

Amazon S3 > Buckets > Create bucket

Create bucket

Buckets are containers for data stored in S3. [Learn more](#)

General configuration

Bucket name

3tier-project-bucket

Bucket name must be unique within the global namespace and follow the bucket naming rules. [See rules for bucket naming](#)

AWS Region

US East (N. Virginia) us-east-1

Copy settings from existing bucket - *optional*

Only the bucket settings in the following configuration are copied.

[Choose bucket](#)

Object Ownership

Control ownership of objects written to this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership determines who can specify access to objects.

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3. When adding permissions, include the following AWS managed policies. You can search for them and select them. These policies will allow our instances to download our code from S3 and use Systems Manager Session Manager to securely connect to our instances without SSH keys through the AWS console.

- **AmazonSSMManagedInstanceCore**
- **AmazonS3ReadOnlyAccess**

The screenshot shows the AWS IAM 'Add permissions' step. The search bar at the top contains the text 'AmazonSSMManagedInstanceCore'. Below the search bar, a table lists a single policy: 'AmazonSSMManagedInstanceCore' (AWS managed, The policy for Amazon EC2 Role to enable AWS Systems Manager service core functionality.).

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

aws Services Search [Alt+S]

IAM > Roles > Create role

Step 1 Select trusted entity

Step 2 Add permissions

Step 3 Name, review, and create

Select trusted entity Info

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 Allows 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

EC2

Choose a use case for the specified service.

Use case

EC2

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Part 1: Networking and Security

In this section we will be building out the VPC networking components as well as security groups that will add a layer of protection around our EC2 instances, Aurora databases, and Elastic Load Balancers.

Learning Objectives:

- Create an isolated network with the following components:
 - VPC
 - Subnets
 - Route Tables
 - Internet Gateway
 - NAT gateway
 - Security Groups

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AWS Three | GitHub - ian | Console Home | S3 buckets | Dashboard | Roles | IAM | RDS | us-east-1 | vpcs | GitHub - aw | AWS Three | +

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

aws Services Search [Alt+S] Actions Create VPC

VPC dashboard EC2 Global View Filter by VPC: Select a VPC Virtual private cloud Your VPCs (1/2) Info

Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DHCP option set
-	vpc-03fd1615f6a986005	Available	172.31.0.0/16	-	dopt-0e0c582a7c
<input checked="" type="checkbox"/> VPC-3TIER	vpc-02af9ec2fad7ffb7c	Available	10.0.0.0/16	-	dopt-0e0c582a7c

vpc-02af9ec2fad7ffb7c / VPC-3TIER

Details Resource map New CIDRs Flow logs Tags Integrations

Details			
VPC ID vpc-02af9ec2fad7ffb7c	State Available	DNS hostnames Disabled	DNS resolution Enabled
Tenancy Default	DHCP option set dopt-0e0c582a7461c88c7	Main route table -	Main network ACL -
Default VPC No	IPv4 CIDR 10.0.0.0/16	IPv6 pool -	IPv6 CIDR (Network border group) -

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AWS Three | GitHub - ian | Console Home | S3 buckets | Dashboard | Roles | IAM | RDS | us-east-1 | CreateS | GitHub - aw | AWS Three | +

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

aws Services Search [Alt+S]

VPC > Subnets > Create subnet

Create subnet Info

VPC

VPC ID
Create subnets in this VPC.

vpc-02af9ec2fad7ffb7c (VPC-3TIER)

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 6

Subnet name
Create a tag with a key of 'Name' and a value that you specify.
Public-Web-Subnet-AZ-1

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.
US East (N. Virginia) / us-east-1a

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Internet Gateway
NAT gateway
Security Groups]

VPC - CIDR range - 10.0.0.0/16

Public-Web-Subnet-AZ-1 - 10.0.0.0/24 - us-east-1a

Public-Web-Subnet-AZ-2 - 10.0.1.0/24 - us-east-1b

Private-App-Subnet-AZ-1 - 10.0.2.0/24 - us-east-1a

Private-App-Subnet-AZ-2 - 10.0.3.0/24 - us-east-1b

Private-DB-Subnet-AZ-1 - 10.0.4.0/24 - us-east-1a

Private-DB-Subnet-AZ-2 - 10.0.5.0/24 - us-east-1b

Create Internet Gateway - Attach igw to VPC

Create NAT gateway - Public Subnet AZ-1



AWS Three | GitHub - ian | Console Home | S3 buckets | Dashboard | Roles | IAM | RDS | us-east-1 | subnets | GitHub - aw | AWS Three | + | V

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

aws Services Search [Alt+S] Actions Create subnet

VPC dashboard EC2 Global View Filter by VPC: Select a VPC

Virtual private cloud Your VPCs Subnets Route tables Internet gateways Egress-only internet gateways Carrier gateways DHCP option sets Elastic IPs Managed prefix lists Endpoints Endpoint services NAT gateways Peering connections Security Network ACLs Security groups

Subnets (1/6) Info Find resources by attribute or tag

Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR
Private-App-Subnet-AZ-2	subnet-0489fc8af0c95e8c2	Available	vpc-02af9ec2fad7ffb7c VPC-3...	10.0.3.0/24	-
Public-Web-Subnet-AZ-2	subnet-0a8d6e5542317c7c7	Available	vpc-02af9ec2fad7ffb7c VPC-3...	10.0.1.0/24	-
Private-App-Subnet-AZ-1	subnet-03a5ca24269152655	Available	vpc-02af9ec2fad7ffb7c VPC-3...	10.0.2.0/24	-
Private-DB-Subnet-AZ-2	subnet-0d654e90080ee67f6	Available	vpc-02af9ec2fad7ffb7c VPC-3...	10.0.5.0/24	-
Private-DB-Subnet-AZ-1	subnet-0ec96361fea19ebfc	Available	vpc-02af9ec2fad7ffb7c VPC-3...	10.0.4.0/24	-
Public-Web-Subnet-AZ-1	subnet-0622093a71429752e	Available	vpc-02af9ec2fad7ffb7c VPC-3...	10.0.0.0/24	-

subnet-0622093a71429752e / Public-Web-Subnet-AZ-1

Details Flow logs Route table Network ACL CIDR reservations Sharing Tags

Details

Subnet ID subnet-0622093a71429752e	Subnet ARN arn:aws:ec2:us-east-1:782921506756:subnet/subnet-0622093a71429752e	State Available	IPv4 CIDR 10.0.0.0/24
Available IPv4 addresses 251		Availability Zone us-east-1a	Availability Zone ID use1-az2
Network border group us-east-1	IPv6 CIDR -	Route table rtb-0427a2d2cda406e3r	Network ACL acl-0f87056cae0a4b858

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AWS Three | GitHub - ian | Console Home | S3 buckets | Dashboard | Roles | IAM | RDS | us-east-1 | vpcs | GitHub - aw | AWS Three | +

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

VPC dashboard | Services | Search | [Alt+S] | Actions | Create VPC | N. Virginia | Subham Pradhan

Your VPCs (1/2) Info

Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DHCP option set
-	vpc-03fd1615f6a986005	Available	172.31.0.0/16	-	dopt-0e0c582a7c
<input checked="" type="checkbox"/> VPC-3TIER	vpc-02af9ec2fad7ffb7c	Available	10.0.0.0/16	-	dopt-0e0c582a7c

Virtual private cloud

Your VPCs

Subnets

Route tables

Internet gateways

Egress-only internet gateways

Carrier gateways

DHCP option sets

Elastic IPs

Managed prefix lists

Endpoints

Endpoint services

NAT gateways

Peering connections

Security

Network ACLs

Security groups

VPC Show details Your AWS virtual network

VPC-3TIER

Subnets (6) Subnets within this VPC

- us-east-1a
 - Private-App-Subnet-AZ-1
 - Private-DB-Subnet-AZ-1
 - Public-Web-Subnet-AZ-1
- us-east-1b
 - Private-App-Subnet-AZ-2
 - Public-Web-Subnet-AZ-2
 - Private-DB-Subnet-AZ-2

Route tables (1) Route network traffic to resources

rtb-0427a2d2cda406e3c

Network connection Connections to other networks

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AWS Three | GitHub - ian | Console Home | S3 buckets | Dashboard | Roles | IAM | RDS | us-east-1 | Create | GitHub - aw | AWS Three | +

us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateInternetG... | Search | [Alt+S]

aws Services | VPC > Internet gateways > Create internet gateway

Create internet gateway Info

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

Internet gateway settings

Name tag
Creates a tag with a key of 'Name' and a value that you specify.
3tier-IGW

Tags - optional

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

Key	Value - optional
<input type="text" value="Name"/> <input type="button" value="X"/>	<input type="text" value="3tier-IGW"/> <input type="button" value="X"/> <input type="button" value="Remove"/>

Add new tag
You can add 49 more tags.

Cancel

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Internet gateways (1) [Info](#)

[Search](#)

<input type="checkbox"/>	Name	<input type="checkbox"/>	Internet gateway ID	<input type="checkbox"/>	State	<input type="checkbox"/>	VP
<input type="checkbox"/>	3tier-IGW	<input type="checkbox"/>	igw-07dbd8aeee63fe504	<input checked="" type="checkbox"/>	Attached	<input type="checkbox"/>	vpc



AWS Three | GitHub - ian | Console Home | S3 buckets | Dashboard | Roles | IAM | RDS | us-east-1 | Create... | GitHub - aw | AWS Three | +

us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateNatGateway... | Search | [Alt+S]

aws Services Search [Alt+S] | N. Virginia | Subham Pradhan

VPC > NAT_gateways > Create NAT gateway

Create NAT gateway Info

A highly available, managed Network Address Translation (NAT) service that instances in private subnets can use to connect to services in other VPCs, on-premises networks, or the internet.

NAT gateway settings

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

3tier-NGW-AZ-1

The name can be up to 256 characters long.

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

subnet-0622093a71429752e (Public-Web-Subnet-AZ-1)

Connectivity type
Select a connectivity type for the NAT gateway.

Public
 Private

Elastic IP allocation ID Info
Assign an Elastic IP address to the NAT gateway.

eipalloc-085025fea2e16fdc4

Allocate Elastic IP

▶ Additional settings Info



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AWS Three | GitHub - ian | Console Home | S3 buckets | Dashboard | Roles | IAM | RDS | us-east-1 | NatGateways | GitHub - aw | AWS Three | + | V | - | X

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

aws Services Search [Alt+S] N. Virginia Subham Pradhan

NAT gateways (2) Info

Filter NAT gateways

Name	NAT gateway ID	Connectivit...	State	State message	Primary public I...	Primary private ...
3tier-NGW-AZ-1	nat-03940d63bbb8fbf2b	Public	Pending	-	-	10.0.0.66
3tier-NGW-AZ-2	nat-0a0c877718af3860b	Public	Pending	-	-	10.0.1.75

Select a NAT gateway

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AWS Three | GitHub - ian | Console Home | S3 buckets | Dashboard | Roles | IAM | RDS | us-east-1 | Create | GitHub - aw | AWS Three | + | V | - | X

us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateRouteTable: | ↻ | 🔍 | 📁 | 🚫 | VPN | ⏹

aws | Services | Search [Alt+S] | ☰ | 🔍 | 📁 | 🚫 | 🌐 | 🌐 | 🌐 | N. Virginia | Subham Pradhan | ⓘ

VPC > Route tables > Create route table

Create route table Info

A route table specifies how packets are forwarded between the subnets within your VPC, the internet, and your VPN connection.

Route table settings

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

Public-RT

VPC
The VPC to use for this route table.

vpc-02af9ec2fad7ff7c (VPC-3TIER)

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*

Q Name X Q Public-RT X Remove

Add new tag

You can add 49 more tags.

Cancel Create route table

AWS Three | GitHub - ian | Console Home | S3 buckets | Dashboard | Roles | IAM | RDS | us-east-1 | EditRoute | GitHub - aw | AWS Three | + | V | - | X

us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#EditRoutes:RouteTableId=rtb-03426ff4280561725

aws Services Search [Alt+S]

VPC > Route tables > rtb-03426ff4280561725 > Edit routes

Edit routes

Destination	Target	Status	Propagated
10.0.0.0/16	local	Active	No
0.0.0.0/0	Internet Gateway	-	No

Add route Remove

Cancel Preview Save changes

AWS Three | GitHub - ian | Console Home | S3 buckets | Dashboard | Roles | IAM | RDS | us-east-1 | EditRouteTable | GitHub - aw | AWS Three | + | V | - | X

us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#EditRouteTableS... | Search | [Alt+S] | Services | N. Virginia | Subham Pradhan | VPN | More

VPC > Route tables > rtb-03426ff4280561725 > Edit subnet associations

Edit subnet associations

Change which subnets are associated with this route table.

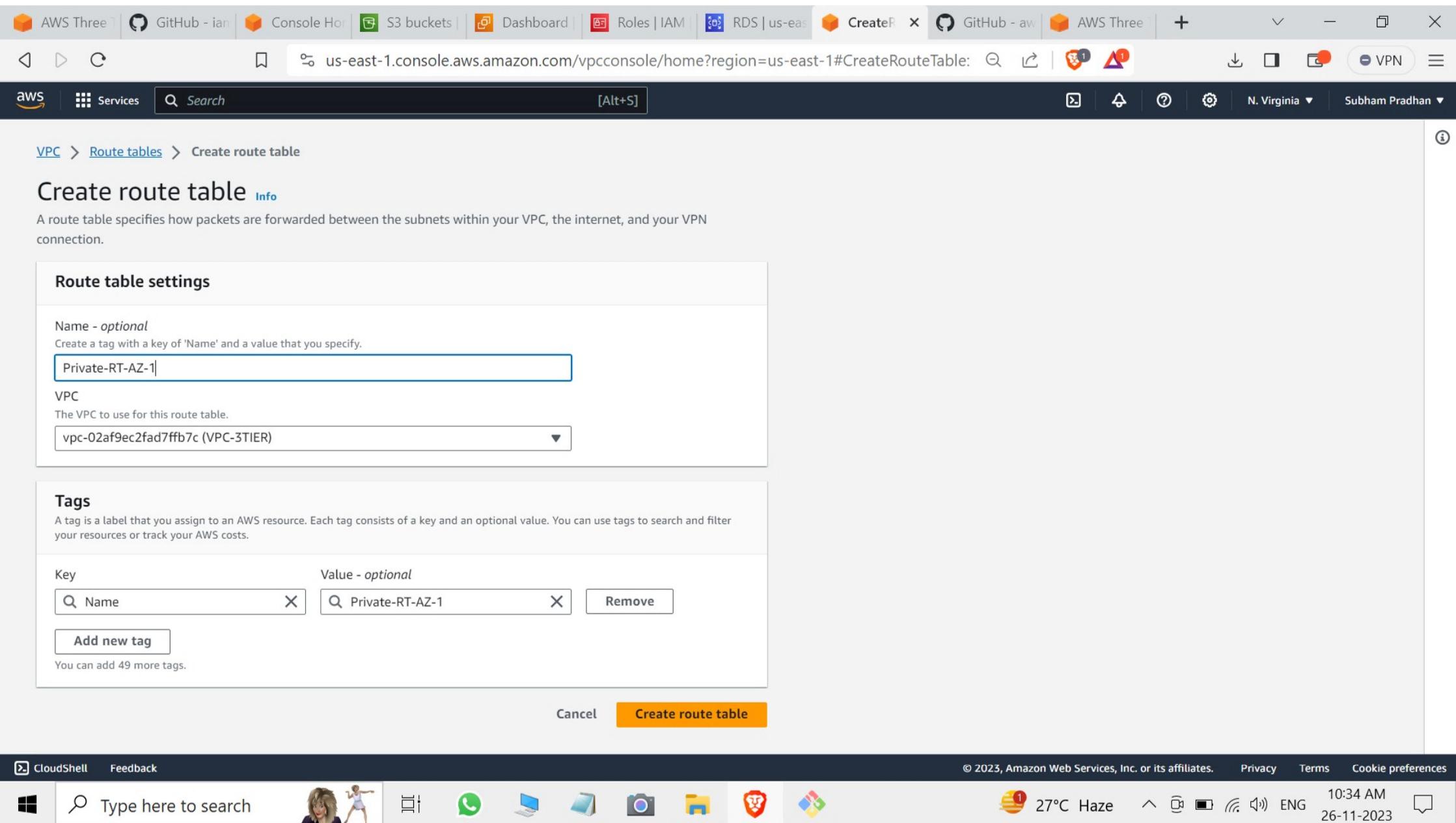
Available subnets (2/6)

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
Private-App-Subnet-AZ-2	subnet-0489fc8af0c95e8c2	10.0.3.0/24	-	Main (rtb-0427a2d2cda406e3c)
Public-Web-Subnet-AZ-2	subnet-0a8d6e5542317c7c7	10.0.1.0/24	-	Main (rtb-0427a2d2cda406e3c)
Private-App-Subnet-AZ-1	subnet-03a5ca24269152655	10.0.2.0/24	-	Main (rtb-0427a2d2cda406e3c)
Private-DB-Subnet-AZ-2	subnet-0d654e90080ee6f6	10.0.5.0/24	-	Main (rtb-0427a2d2cda406e3c)
Private-DB-Subnet-AZ-1	subnet-0ec96361fea19ebfc	10.0.4.0/24	-	Main (rtb-0427a2d2cda406e3c)
Public-Web-Subnet-AZ-1	subnet-0622093a71429752e	10.0.0.0/24	-	Main (rtb-0427a2d2cda406e3c)

Selected subnets

subnet-0622093a71429752e / Public-Web-Subnet-AZ-1 X | subnet-0a8d6e5542317c7c7 / Public-Web-Subnet-AZ-2 X

Cancel Save associations



AWS Three | GitHub - ian | Console Home | S3 buckets | Dashboard | Roles | IAM | RDS | us-east-1 | EditRoute | GitHub - aw | AWS Three | + | V | - | X

us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#EditRoutes:RouteTableId=rtb-07f6e41a3d9c73790

aws Services Search [Alt+S]

VPC > Route tables > rtb-07f6e41a3d9c73790 > Edit routes

Edit routes

Destination	Target	Status	Propagated
10.0.0.0/16	local	Active	No
0.0.0.0/0	NAT Gateway	-	No
	nat-03940d63bbb8fbf2b		<button>Remove</button>
	nat-03940d63bbb8fbf2b (3tier-NGW-AZ-1)		
	nat-0a0c877718af3860b (3tier-NGW-AZ-2)		

Add route

Cancel Preview Save changes

AWS Three | GitHub - ian | Console Home | S3 buckets | Dashboard | Roles | IAM | RDS | us-east-1 | EditRouteTable | GitHub - aw | AWS Three | + | V | - | X

us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#EditRouteTableS... | [Alt+S]

aws Services Search N. Virginia Subham Pradhan

VPC > Route tables > rtb-07f6e41a3d9c73790 > Edit subnet associations

Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (1/6)

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
Private-App-Subnet-AZ-2	subnet-0489fc8af0c95e8c2	10.0.3.0/24	-	Main (rtb-0427a2d2cda406e3c)
Public-Web-Subnet-AZ-2	subnet-0a8d6e5542317c7c7	10.0.1.0/24	-	rtb-03426ff4280561725 / Public-RT
Private-App-Subnet-AZ-1	subnet-03a5ca24269152655	10.0.2.0/24	-	Main (rtb-0427a2d2cda406e3c)
Private-DB-Subnet-AZ-2	subnet-0d654e90080ee67f6	10.0.5.0/24	-	Main (rtb-0427a2d2cda406e3c)
Private-DB-Subnet-AZ-1	subnet-0ec96361fea19ebfc	10.0.4.0/24	-	Main (rtb-0427a2d2cda406e3c)
Public-Web-Subnet-AZ-1	subnet-0622093a71429752e	10.0.0.0/24	-	rtb-03426ff4280561725 / Public-RT

Selected subnets

subnet-03a5ca24269152655 / Private-App-Subnet-AZ-1 X

Cancel Save associations

AWS Three | GitHub - ian | Console Home | S3 buckets | Dashboard | Roles | IAM | RDS | us-east-1 | VPC Co... | GitHub - aw | AWS Three | + | VPN

aws Services Search [Alt+S] N. Virginia Subham Pradhan

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
InternetFacing-lb-sg
Name cannot be edited after creation.

Description Info
External load balancer security groups

VPC Info
vpc-02af9ec2fad7ffb7c (VPC-3TIER)

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	Anywhere-... ▾ 0.0.0.0/0 X	<input type="text"/> Delete
HTTP	TCP	80	Anywhere-... ▾ ::/0 X	<input type="text"/> Delete

Add rule

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Type here to search

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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

WebTier-sg

Name cannot be edited after creation.

Description Info

WebTier-sg

VPC Info

vpc-02af9ec2fad7ffb7c (VPC-3TIER)

Inbound rules Info

Type Info

Protocol Info

Port range Info

Source Info

Description - optional Info

HTTP

TCP

80

Custom

sg-09a2ad3fdfcd6bc5b



Delete

sg-09a2ad3fdfcd6bc5b

HTTP

TCP

80

My IP



152.58.149.51/32

Delete

Add rule



Type here to search



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10:42 AM
26-11-2023

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

Internal-lb-sg

Name cannot be edited after creation.

Description Info

Internal-lb-sg

VPC Info

vpc-02af9ec2fad7ffb7c (VPC-3TIER)

Inbound rules Info

Type Info

Protocol Info

Port range Info

Source Info

Description - optional Info

HTTP

TCP

80

Custom

sg-054a20c0515fe73de

X

Delete

sg-054a20c0515fe73de

Add rule

Outbound rules Info



Type here to search



27°C Haze



10:43 AM
26-11-2023

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

Name cannot be edited after creation.

Description Info

VPC Info

Inbound rules Info

Type Info

Protocol Info

Port range Info

Source Info

Description - optional Info

 XDelete X XDelete XAdd rule

Type here to search



27°C Haze



10:45 AM
26-11-2023

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

DB-sg

Name cannot be edited after creation.

Description Info

DB-sg

VPC Info

vpc-02af9ec2fad7ffb7c (VPC-3TIER)

Inbound rules Info

Type Info

Protocol Info

Port range Info

Source Info

Description - optional Info

MYSQL/Aurora

TCP

3306

Custom

sg-0ecde1e7554abbf3e



Delete

sg-0ecde1e7554abbf3e

Add rule

Outbound rules Info



Type here to search



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Create Security Groups: InternetFacing-lb-sg (External load balancer security groups) - HTTP - Anywhere-IPv4 and HTTP - Anywhere-IPv6
WebTier-sg - HTTP - InternalFacing-lb-sg and HTTP - MYIP
Internal-lb-sg (WebServer Can Access Only) - HTTP - WebTier-sg
Private-instance-sg - HTTP - Internal-lb-sg - port-4000 and HTTP - MYIP - port-4000
DB-sg - MYSQL/Aurora - Custom - Private-instance-sg - port-3306

Amazon RDS

- Dashboard
- Databases
- Query Editor
- Performance insights
- Snapshots
- Exports in Amazon S3
- Automated backups
- Reserved instances
- Proxies

Subnet groups

- Parameter groups
- Option groups
- Custom engine versions
- Zero-ETL integrations New

Events

- Event subscriptions

Recommendations

0 Type here to search

RDS > Subnet groups > Create DB subnet group

Create DB subnet group

To create a new subnet group, give it a name and a description, and choose an existing VPC. You will then be able to add subnets related to that VPC.

Subnet group details

Name

You won't be able to modify the name after your subnet group has been created.

Must contain from 1 to 255 characters. Alphanumeric characters, spaces, hyphens, underscores, and periods are allowed.

Description

VPC

Choose a VPC identifier that corresponds to the subnets you want to use for your DB subnet group. You won't be able to choose a different VPC identifier after your subnet group has been created.

Add subnets

Availability Zones

Choose the Availability Zones that include the subnets you want to add.

1 27°C Haze

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26-11-2023

AWS Three GitHub - ian Console Home S3 buckets Dashboard Roles | IAM RDS | u VPC Consol GitHub - aw AWS Three +

Add subnets

Availability Zones
Choose the Availability Zones that include the subnets you want to add.

Choose an availability zone ▾

us-east-1a X us-east-1b X

Subnets
Choose the subnets that you want to add. The list includes the subnets in the selected Availability Zones.

Select subnets ▾

subnet-0ec96361fea19ebfc (10.0.4.0/24) X

subnet-0d654e90080ee67f6 (10.0.5.0/24) X

For Multi-AZ DB clusters, you must select 3 subnets in 3 different Availability Zones.

Subnets selected (2)

Availability zone	Subnet ID	CIDR block
us-east-1a	subnet-0ec96361fea19ebfc	10.0.4.0/24
us-east-1b	subnet-0d654e90080ee67f6	10.0.5.0/24

Cancel Create

AWS Three | GitHub - ian | Console Home | S3 buckets | Dashboard | Roles | IAM | RDS | subnets | VP | GitHub - aw | AWS Three | +

us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#launch-dbinstance:

RDS Services Search [Alt+S] N. Virginia Subham Pradhan VPN

RDS > Create database

Create database

Choose a database creation method Info

Standard create
You set all of the configuration options, including ones for availability, security, backups, and maintenance.

Easy create
Use recommended best-practice configurations. Some configuration options can be changed after the database is created.

Engine options

Engine type Info

Aurora (MySQL Compatible)


Aurora (PostgreSQL Compatible)


MySQL


MariaDB


PostgreSQL


Oracle


Microsoft SQL Server


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us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#launch-dbinstance:

aws Services Search [Alt+S] N. Virginia Subham Pradhan

Settings

DB cluster identifier [Info](#)
Enter a name for your DB cluster. The name must be unique across all DB clusters owned by your AWS account in the current AWS Region.
The DB cluster identifier is case-insensitive, but is stored as all lowercase (as in "mydbcluster"). Constraints: 1 to 60 alphanumeric characters or hyphens. First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.

Credentials Settings

Master username [Info](#)
Type a login ID for the master user of your DB instance.
1 to 32 alphanumeric characters. The first character must be a letter.
 Manage master credentials in AWS Secrets Manager
Manage master user credentials in Secrets Manager. RDS can generate a password for you and manage it throughout its lifecycle.

Info If you manage the master user credentials in Secrets Manager, some RDS features aren't supported.
[Learn more](#)

Auto generate a password
Amazon RDS can generate a password for you, or you can specify your own password.

Master password [Info](#)
Constraints: At least 8 printable ASCII characters. Can't contain any of the following: / (slash), '(single quote)', "(double quote)" and @ (at sign).
Confirm master password [Info](#)

Cluster storage configuration - new

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us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#launch-dbinstance:

aws Services Search [Alt+S]

Configuration options

Database instance, storage, and I/O charges vary depending on the configuration. [Learn more](#)

Aurora Standard

- Cost-effective pricing for many applications with moderate I/O usage (I/O costs <25% of total database costs).
- Pay-per-request I/O charges apply. DB instance and storage prices don't include I/O usage.

Aurora I/O-Optimized

- Predictable pricing for all applications. Improved price performance for I/O-intensive applications (I/O costs >25% of total database costs).
- No additional charges for read/write I/O operations. DB instance and storage prices include I/O usage.

Instance configuration

The DB instance configuration options below are limited to those supported by the engine that you selected above.

DB instance class [Info](#)

Hide filters

Include previous generation classes

Serverless v2

Memory optimized classes (includes r classes)

Burstable classes (includes t classes)

db.r6g.2xlarge

8 vCPUs 64 GiB RAM Network: 4,750 Mbps

Availability & durability

Multi-AZ deployment [Info](#)

Create an Aurora Replica or Reader node in a different AZ (recommended for scaled availability)
Create an Aurora Replica for fast failover and high availability

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us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#launch-dbinstance:

aws Services Search [Alt+S]

db.r6g.2xlarge
8 vCPUs 64 GiB RAM Network: 4,750 Mbps

Availability & durability

Multi-AZ deployment [Info](#)

Create an Aurora Replica or Reader node in a different AZ (recommended for scaled availability)
Creates an Aurora Replica for fast failover and high availability.

Don't create an Aurora Replica

Connectivity [Info](#)

Compute resource

Choose whether to set up a connection to a compute resource for this database. Setting up a connection will automatically change connectivity settings so that the compute resource can connect to this database.

Don't connect to an EC2 compute resource
Don't set up a connection to a compute resource for this database. You can manually set up a connection to a compute resource later.

Connect to an EC2 compute resource
Set up a connection to an EC2 compute resource for this database.

Network type [Info](#)

To use dual-stack mode, make sure that you associate an IPv6 CIDR block with a subnet in the VPC you specify.

IPv4
Your resources can communicate only over the IPv4 addressing protocol.

Dual-stack mode
Your resources can communicate over IPv4, IPv6, or both.

Virtual private cloud (VPC) [Info](#)

Choose the VPC. The VPC defines the virtual networking environment for this DB cluster.

VPC-3TIER (vpc-02af9ec2fad7ffb7c)
6 Subnets, 2 Availability Zones

Only VPCs with a corresponding DB subnet group are listed.

After a database is created, you can't change its VPC.

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us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#launch-dbinstance:

Services Search [Alt+S]

DB subnet group [Info](#)
Choose the DB subnet group. The DB subnet group defines which subnets and IP ranges the DB cluster can use in the VPC that you selected.
three-tier-db-subnet-group 2 Subnets, 2 Availability Zones

Public access [Info](#)
 Yes
RDS assigns a public IP address to the cluster. Amazon EC2 instances and other resources outside of the VPC can connect to your cluster. Resources inside the VPC can also connect to the cluster. Choose one or more VPC security groups that specify which resources can connect to the cluster.
 No
RDS doesn't assign a public IP address to the cluster. Only Amazon EC2 instances and other resources inside the VPC can connect to your cluster. Choose one or more VPC security groups that specify which resources can connect to the cluster.

VPC security group (firewall) [Info](#)
Choose one or more VPC security groups to allow access to your database. Make sure that the security group rules allow the appropriate incoming traffic.
 Choose existing Choose existing VPC security groups
 Create new Create new VPC security group

Existing VPC security groups
Choose one or more options ▾
DB-sg X

RDS Proxy
RDS Proxy is a fully managed, highly available database proxy that improves application scalability, resiliency, and security.
 Create an RDS Proxy [Info](#)
RDS automatically creates an IAM role and a Secrets Manager secret for the proxy. RDS Proxy has additional costs. For more information, see [Amazon RDS Proxy pricing](#).

Certificate authority - optional [Info](#)
Using a server certificate provides an extra layer of security by validating that the connection is being made to an Amazon database. It does so by checking the server certificate that is automatically installed on all databases that you provision.
rds-ca-2019 (default) Expiry: Aug 22, 2024
If you don't select a certificate authority, RDS chooses one for you.

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

aws Services Search [Alt+S]

Amazon RDS X

Creating database [database-1](#)

Your database might take a few minutes to launch.

You can use settings from database-1 to simplify configuration of [suggested database add-ons](#) while we finish creating your DB for you.

RDS > Databases

Databases (3)

Group resources C Modify Actions ▾ Restore from S3 Create database

Filter by databases

DB identifier	Status	Role	Engine	Region & AZ	Size	Actions	CPU	Current activity	Maintenance	VPC
database-1	Creating	Regional cluster	Aurora MySQL	us-east-1	2 instances	-	-	-	none	-
database-1-instance-1	Creating	Reader instance	Aurora MySQL	us-east-1b	db.r6g.2xlarge	-	-	-	none	vpc-02a
database-1-instance-1-us-east-1a	Creating	Reader instance	Aurora MySQL	us-east-1a	db.r6g.2xlarge	-	-	-	none	vpc-02a

Events

Event subscriptions

Recommendations 0

Certificate update 2

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

aws Services Search [Alt+S]

EC2 > Instances > Launch an instance

Launch an instance Info

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags Info

Name
MyWebServer-1 Add additional tags

Application and OS Images (Amazon Machine Image) Info

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

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

Recents Quick Start

Amazon Linux macOS Ubuntu Windows Red Hat SUSE Li View All AMIs

Summary

Number of instances Info
1

Software Image (AMI)
Amazon Linux 2 Kernel 5.10 AMI...read more
ami-0fa1ca9559f1892ec

Virtual server type (instance type)
t2.micro

Firewall (security group)
Private-instance-sg

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

i Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month. 30 GiB of EBS

Cancel **Launch instance** Review commands

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The screenshot shows the AWS Launch Wizard interface for launching a new Amazon Linux 2 instance. The left panel displays network settings, including a VPC (vpc-02af9ec2fad7ffb7c) and subnet (subnet-0622093a71429752e). It also includes options for auto-assigning public IP and selecting a security group. The right panel shows a summary of the instance configuration, including the number of instances (1), software image (Amazon Linux 2 Kernel 5.10 AMI), virtual server type (t2.micro), firewall (Private-instance-sg), and storage (1 volume(s) - 8 GiB). A callout box highlights the free tier information: "Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month. 30 GiB of EBS".

Key pair name - required
Proceed without a key pair (Not recommended) Default value ▾ Create new key pair [Alt+S]

▼ Network settings Info

VPC - required Info
vpc-02af9ec2fad7ffb7c (VPC-3TIER)
10.0.0.0/16

Subnet Info
subnet-0622093a71429752e Public-Web-Subnet-AZ-1
VPC: vpc-02af9ec2fad7ffb7c Owner: 782921506756 Availability Zone: us-east-1a
IP addresses available: 250 CIDR: 10.0.0.0/24 Create new subnet

Auto-assign public IP Info
Disable

Firewall (security groups) Info
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.
Create security group Select existing security group

Common security groups Info
Select security groups
Private-instance-sg sg-0ecd1e7554abbf3e X
VPC: vpc-02af9ec2fad7ffb7c

Compare security group rules

▼ Summary

Number of instances Info
1

Software Image (AMI)
Amazon Linux 2 Kernel 5.10 AMI...read more
ami-0fa1ca9559f1892ec

Virtual server type (instance type)
t2.micro

Firewall (security group)
Private-instance-sg

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

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month. 30 GiB of EBS

Cancel Launch instance Review commands



AWS Three | GitHub - ian | Console Home | S3 buckets | Launch | Roles | IAM | Databases | subnets | VP GitHub - aw | AWS Three | +

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

aws Services Search [Alt+S]

0 x File systems Edit

Advanced details Info

Domain join directory Info

Select Create new directory

IAM instance profile Info

Select Create new IAM profile

3tier-ROLE-IAM
arn:aws:iam::782921506756:instance-profile/3tier-ROLE-IAM

Enable IP name IPv4 (A record) DNS requests

Enable resource-based IPv4 (A record) DNS requests

Enable resource-based IPv6 (AAAA record) DNS requests

Instance auto-recovery Info

Select

Shutdown behavior Info

Stop

Summary

Number of instances Info

1

Software Image (AMI)

Amazon Linux 2 Kernel 5.10 AMI...read more
ami-0fa1ca9559f1892ec

Virtual server type (instance type)

t2.micro

Firewall (security group)

Private-instance-sg

Storage (volumes)

1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month. 30 GiB of EBS

Cancel Launch instance Review commands

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Instances (1/1) Info						
<input type="checkbox"/> Name		Instance ID	Instance state	Instance type	Status check	Alarm status
<input checked="" type="checkbox"/>	MyWebServer-1	i-09ce7827c28146dda	Running	t2.micro	2/2 checks pass	No alarms

Instance: i-09ce7827c28146dda (MyWebServer-1)

[Details](#) [Security](#) [Networking](#) [Storage](#) [Status checks](#) [Monitoring](#) [Tags](#)

Instance summary [Info](#)

Instance ID	Public IPv4 address	Private IPv4 addresses
i-09ce7827c28146dda (MyWebServer-1)	-	10.0.0.206
IPv6 address	Instance state	Public IPv4 DNS
-	Running	-

Type here to search 27°C Haze ENG 11:03 AM 26-11-2023

[EC2 Instance Connect](#)[Session Manager](#)[SSH client](#)[EC2 serial console](#)

Session Manager usage:

- Connect to your instance without SSH keys, a bastion host, or opening any inbound ports.
- Sessions are secured using an AWS Key Management Service key.
- You can log session commands and details in an Amazon S3 bucket or CloudWatch Logs log group.
- Configure sessions on the Session Manager [Preferences](#) page.

[Cancel](#)[Connect](#)



Session ID: root-0714b12fb68cf9bc

Instance ID: i-0d903cbc434883887

Terminate

```
sh-4.2$ ^M
sh: $'\r': command not found
sh-4.2$ sudo -su ec2-user
[ec2-user@ip-10-0-2-223 bin]$
[ec2-user@ip-10-0-2-223 bin]$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=116 time=3.95 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=116 time=1.24 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=116 time=1.22 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=116 time=1.19 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=116 time=1.23 ms
64 bytes from 8.8.8.8: icmp_seq=6 ttl=116 time=1.22 ms
64 bytes from 8.8.8.8: icmp_seq=7 ttl=116 time=1.20 ms
64 bytes from 8.8.8.8: icmp_seq=8 ttl=116 time=1.19 ms
64 bytes from 8.8.8.8: icmp_seq=9 ttl=116 time=1.14 ms
64 bytes from 8.8.8.8: icmp_seq=10 ttl=116 time=1.20 ms
64 bytes from 8.8.8.8: icmp_seq=11 ttl=116 time=1.18 ms
64 bytes from 8.8.8.8: icmp_seq=12 ttl=116 time=1.37 ms
```



Type here to search



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11:40 AM
26-11-2023



```
[ec2-user@ip-10-0-2-223 bin]$ sudo yum install mysql -y
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
amzn2-core
Resolving Dependencies
--> Running transaction check
---> Package mariadb.x86_64 1:5.5.68-1.amzn2.0.1 will be installed
--> Finished Dependency Resolution
```

Dependencies Resolved

```
=====
Package           Arch         Version          Repository      Size
=====
Installing:
mariadb          x86_64      1:5.5.68-1.amzn2.0.1   amzn2-core    8.8 M
```

Transaction Summary

Install 1 Package

Total download size: 8.8 M

Installed size: 49 M

Downloading packages:

```
mariadb-5.5.68-1.amzn2.0.1.x86_64.rpm          | 8.8 MB  00:00:00
```

Running transaction check

Running transaction test

Transaction test succeeded

Running transaction

```
  Installing : 1:mariadb-5.5.68-1.amzn2.0.1.x86_64      1/1
```



AWS Three GitHub - ie Console H S3 buckets Connect to Systems M 3tier-ROLE RDS subnets GitHub - a AWS Three +

us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#database:id=database-1-instance-1a

aws Services Search [Alt+S]

Amazon RDS X

Dashboard

Databases

Query Editor

Performance insights

Snapshots

Exports in Amazon S3

Automated backups

Reserved instances

Proxies

Subnet groups

Parameter groups

Option groups

Custom engine versions

Zero-ETL integrations New

Services N. Virginia Subham Pradhan

database-1 Available Regional cluster Aurora MySQL us-east-1 2

database-1-instance-1 Available Writer instance Aurora MySQL us-east-1b d

database-1-instance-1-us-east-1a Available Reader instance Aurora MySQL us-east-1a d

Connectivity & security Monitoring Logs & events Configuration Maintenance & backups Tags

Connectivity & security

Endpoint & port	Networking	Security
Endpoint database-1-instance-1.c0capommwqmn.us-east-1.rds.amazonaws.com	Availability Zone us-east-1b	VPC security groups DB-sg (sg-0f72c5fdfebe2e80) Active
Port 3306	VPC VPC-3TIER (vpc-02af9ec2fad7ffb7c)	Publicly accessible No
	Subnet group	

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Session ID: root-0714b12fb68cf9bc Instance ID: i-0d903cbc434883887 [Terminate](#)

```
[ec2-user@ip-10-0-2-223 bin]$ mysql -h database-1-instance-1.c0capommwqmn.us-east-1.rds.amazonaws.com -u admin -p
Enter password:
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MySQL connection id is 305
Server version: 8.0.28 Source distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MySQL [(none)]> CREATE DATABASE webappdb;
Query OK, 1 row affected (0.00 sec)

MySQL [(none)]> SHOW DATABASES;
+-----+
| Database      |
+-----+
| information_schema |
| mysql          |
| performance_schema |
| sys            |
| webappdb       |
+-----+
5 rows in set (0.00 sec)

MySQL [(none)]> USE webappdb;
Database changed
MySQL [webappdb]> CREATE TABLE IF NOT EXISTS transactions(id INT NOT NULL
-> AUTO_INCREMENT, amount DECIMAL(10,2), description
```



AWS Three GitHub - i GitHub - a AWS Three | Console H S3 buckets Connect to System 3tier-ROLE RDS | us-e subnets | GitHub - a AWS Three | +

us-east-1.console.aws.amazon.com/systems-manager/session-manager/i-0d903cbc434883887?reg... | VPN

Session ID: root-0714b12fb68cf9bc

Instance ID: i-0d903cbc434883887

Terminate

5 rows in set (0.00 sec)

MySQL [(none)]> USE webappdb;

Database changed

MySQL [webappdb]> CREATE TABLE IF NOT EXISTS transactions(id INT NOT NULL
-> AUTO_INCREMENT, amount DECIMAL(10,2), description
-> VARCHAR(100), PRIMARY KEY(id));

Query OK, 0 rows affected (0.03 sec)

MySQL [webappdb]> SHOW TABLES;

Tables_in_webappdb	
transactions	

1 row in set (0.00 sec)

MySQL [webappdb]> INSERT INTO transactions (amount,description) VALUES ('400','groceries');

Query OK, 1 row affected (0.01 sec)

MySQL [webappdb]> SELECT * FROM transactions;

id	amount	description
1	400.00	groceries

1 row in set (0.00 sec)

MySQL [webappdb]>



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github.com/aws-samples/aws-three-tier-web-architecture-workshop

aws-samples / aws-three-tier-web-architecture-workshop Public Notifications Fork 133 Star 39

Code Issues 1 Pull requests 2 Actions Projects Security Insights

main 3 branches 0 tags Go to file Code

awsshivs updating dependency typo 20a71db on Jun 1, 2022 16 commits

application-code	updating dependency typo	last year
CODE_OF_CONDUCT.md	Initial commit	last year
CONTRIBUTING.md	Initial commit	last year
LICENSE	Initial commit	last year
README.md	adding published workshop link as instructions	last year

README.md

AWS Three Tier Web Architecture Workshop

Description Type here to search

Notifications Fork 133 Star 39

About

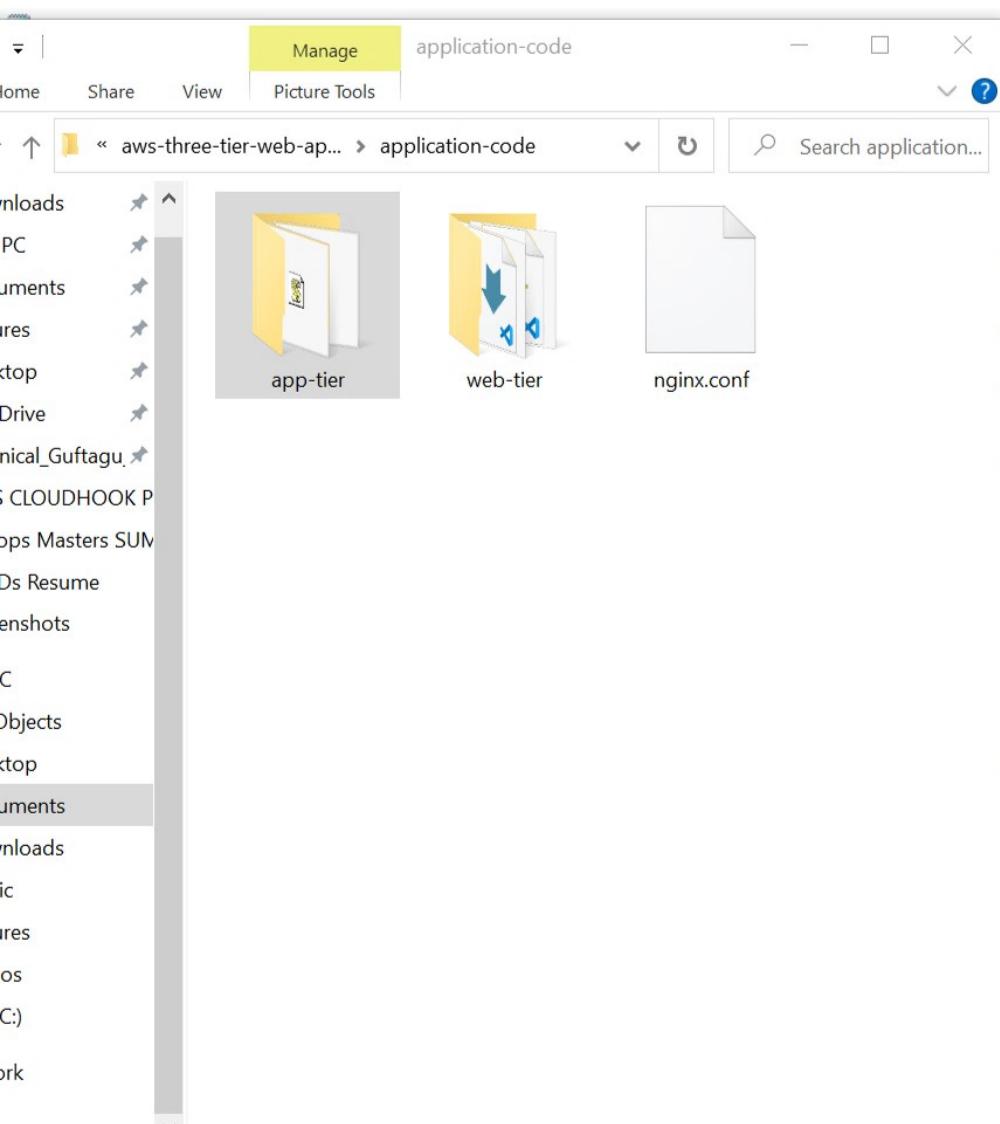
No description, website, or topics provided.

Readme MIT-0 license Code of conduct Security policy Activity 39 stars 7 watching 133 forks Report repository

Releases

No releases published

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s3.console.aws.amazon.co... VPN

aws Services Global Subham Pradhan

Drag and drop files and folders you want to upload here, or choose Add files or Add folder.

Files and folders (6 Total, 47.4 KB)

Remove Add files Add folder

All files and folders in this table will be uploaded.

Find by name

	Name	Folder	Type	Size
<input type="checkbox"/>	DbConfig.js	app-tier/	text/javascript	110.0 B
<input type="checkbox"/>	index.js	app-tier/	text/javascript	3.1 KB
<input type="checkbox"/>	package-lo...	app-tier/	application/	41.8 KB
<input type="checkbox"/>	package.json	app-tier/	application/	655.0 B
<input type="checkbox"/>	README.md	app-tier/	-	12.0 B
<input type="checkbox"/>	Transaction...	app-tier/	text/javascript	1.7 KB

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Systems Manager | us-east-1 +

us-east-1.console.aws.amazon.com/systems-manager/session-manager/i-0d903cbc434883887?regi... | 1 1 VPN

Session ID: root-0714b12fb68cf9bc Instance ID: i-0d903cbc434883887 [Terminate](#)

```
[ec2-user@ip-10-0-2-223 bin]$ curl -o- https://raw.githubusercontent.com/nvm-sh/nvm/v0.38.0/install.sh | bash
% Total    % Received % Xferd  Average Speed   Time     Time      Time  Current
          Dload  Upload   Total Spent    Left Speed
100 14926  100 14926    0     0  179k      0 --:--:-- --:--:-- --:--:-- 179k
=> Downloading nvm as script to '/home/ec2-user/.nvm'

=> Appending nvm source string to /home/ec2-user/.bashrc
=> Appending bash_completion source string to /home/ec2-user/.bashrc
=> Close and reopen your terminal to start using nvm or run the following to use it now:

export NVM_DIR="$HOME/.nvm"
[ -s "$NVM_DIR/nvm.sh" ] && \. "$NVM_DIR/nvm.sh" # This loads nvm
[ -s "$NVM_DIR/bash_completion" ] && \. "$NVM_DIR/bash_completion" # This loads nvm bash_completion
[ec2-user@ip-10-0-2-223 bin]$ source ~/.bashrc
[ec2-user@ip-10-0-2-223 bin]$ nvm install 16
Downloading and installing node v16.20.2...
Downloading https://nodejs.org/dist/v16.20.2/node-v16.20.2-linux-x64.tar.xz...
#####
Computing checksum with sha256sum
Checksums matched!
Now using node v16.20.2 (npm v8.19.4)
Creating default alias: default -> 16 (-> v16.20.2)
[ec2-user@ip-10-0-2-223 bin]$ nvm use 16
Now using node v16.20.2 (npm v8.19.4)
[ec2-user@ip-10-0-2-223 bin]$ npm install -g pm2
( ) :: idealTree:lib: sill idealTree buildDeps
npm WARN deprecated uuid@3.4.0: Please upgrade to version 7 or higher. Older versions may use Math.random() in certain circumstances, which is known to be problematic. See https://v8.dev/blog/math-random for details.
```

Systems Manager | us-east-1 +

us-east-1.console.aws.amazon.com/systems-manager/session-manager/i-0d903cbc434883887?regi... | 1 1 1 VPN

Session ID: root-0714b12fb68cf9bc Instance ID: i-0d903cbc434883887 Terminate

```
Now using node v16.20.2 (npm v8.19.4)
[ec2-user@ip-10-0-2-223 bin]$ npm install -g pm2
( [REDACTED] ) :: idealTree:lib: sill idealTree buildDeps
npm WARN deprecated uuid@3.4.0: Please upgrade to version 7 or higher. Older versions may use Math.random() in certain circumstances, which is known to be problematic. See https://v8.dev/blog/math-random for details.

added 157 packages, and audited 158 packages in 8s

13 packages are looking for funding
  run `npm fund` for details

2 moderate severity vulnerabilities

Some issues need review, and may require choosing
a different dependency.

Run `npm audit` for details.
npm notice
npm notice New major version of npm available! 8.19.4 => 10.2.4
npm notice Changelog: https://github.com/npm/cli/releases/tag/v10.2.4
npm notice Run npm install -g npm@10.2.4 to update!
npm notice
[ec2-user@ip-10-0-2-223 bin]$
[ec2-user@ip-10-0-2-223 bin]$ cd ~/
[ec2-user@ip-10-0-2-223 ~]$ aws s3 cp s3://BUCKET_NAME/app-tier/ app-tier --recursive
fatal error: An error occurred (AllAccessDisabled) when calling the ListObjectsV2 operation: All access to this object has been disabled
[ec2-user@ip-10-0-2-223 ~]$ aws s3 cp s3://3tier-project-bucket/app-tier/ app-tier --recursive
[ec2-user@ip-10-0-2-223 ~]$
```

Systems Manager | us-east-1 +

us-east-1.console.aws.amazon.com/systems-manager/session-manager/i-0d903cbc434883887?regi... | 1 1 VPN

Session ID: root-0714b12fb68cf9bc Instance ID: i-0d903cbc434883887 **Terminate**

```
2.pid
PM2    | 2023-11-26T06:36:54: PM2 log: RPC socket file      : /home/ec2-user/.pm2/rpc.sock
PM2    | 2023-11-26T06:36:54: PM2 log: BUS socket file     : /home/ec2-user/.pm2/publish.sock
PM2    | 2023-11-26T06:36:54: PM2 log: Application log path : /home/ec2-user/.pm2/logs
PM2    | 2023-11-26T06:36:54: PM2 log: Worker Interval       : 30000
PM2    | 2023-11-26T06:36:54: PM2 log: Process dump file    : /home/ec2-user/.pm2/dumps.pm2
PM2    | 2023-11-26T06:36:54: PM2 log: Concurrent actions   : 2
PM2    | 2023-11-26T06:36:54: PM2 log: SIGTERM timeout      : 1600
PM2    | 2023-11-26T06:36:54: PM2 log: =====
=====
^C
[ec2-user@ip-10-0-2-223 app-tier]$ pm2 startup
[PM2] Init System found: systemd
[PM2] To setup the Startup Script, copy/paste the following command:
sudo env PATH=$PATH:/home/ec2-user/.nvm/versions/node/v16.20.2/bin /home/ec2-user/.nvm/versions/node/v16.20.2/lib/node_modules/pm2/bin/pm2 start
up systemd -u ec2-user --hp /home/ec2-user
[ec2-user@ip-10-0-2-223 app-tier]$ pm2 save
[PM2] Saving current process list...
[PM2] [WARN] PM2 is not managing any process, skipping save...
[PM2] [WARN] To force saving use: pm2 save --force
[ec2-user@ip-10-0-2-223 app-tier]$ pm2 save --force
[PM2] Saving current process list...
[PM2] Successfully saved in /home/ec2-user/.pm2/dump.pm2
[ec2-user@ip-10-0-2-223 app-tier]$
```

Type here to search        

1 30°C Haze ⌂ ENG 12:11 PM
26-11-2023

AWS Three | GitHub - ian | Console Hor | Upload obje | Instances | 3tier-ROLE-I | RDS | us-eas | subnets | VP | GitHub - aw | AWS Three | +

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:search=:Running;v=3;c...

aws Services Search [Alt+S]

EC2 Dashboard EC2 Global View Events Instances Instances Instance Types Launch Templates Spot Requests Savings Plans Reserved Instances Dedicated Hosts Capacity Reservations New Images AMIs AMI Catalog Elastic Block Store CloudShell Feedback

Instances (1/1) Info

Find Instance by attribute or tag (case-sensitive)

Running Clear filters

Name	Instance ID	Instance state	Instance type
AppServer-11	i-0d903cbc434883887	Running	t2.micro

Actions ▲ Launch instances ▼

Connect View details Manage instance state Instance settings Networking Security Image and templates Monitor and troubleshoot

Create image Create template from instance Launch more like this

Details Security Networking Storage Status checks Monitoring Tags

Instance: i-0d903cbc434883887 (AppServer-11)

Instance summary Info

Instance ID	Public IPv4 address	Private IPv4 addresses
i-0d903cbc434883887 (AppServer-11)	-	10.0.2.223
IPv6 address	Instance state	Public IPv4 DNS
-	Running	-
Hostname type	Private IP DNS name (IPv4 only)	

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us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateImage:instanceId=i-0d903c... | VPN

aws Services Search [Alt+S]

EC2 > Instances > i-0d903cbc434883887 > Create image

Create image Info

An image (also referred to as an AMI) defines the programs and settings that are applied when you launch an EC2 instance. You can create an image from the configuration of an existing instance.

Instance ID
 i-0d903cbc434883887 (AppServer-11)

Image name
AppTierimage

Maximum 127 characters. Can't be modified after creation.

Image description - *optional*
AppTierimage

Maximum 255 characters

No reboot
 Enable

Instance volumes

AWS Three | GitHub - ian | Console Hor | Upload obje | Step 1 C | 3tier-ROLE-I | RDS | us-eas | subnets | VP | GitHub - aw | AWS Three | +

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

aws Services Search [Alt+S]

EC2 > Target groups > Create target group

Step 1 Specify group details

Step 2 Register targets

Specify group details

Your load balancer routes requests to the targets in a target group and performs health checks on the targets.

Basic configuration

Settings in this section can't be changed after the target group is created.

Choose a target type

Instances

- Supports load balancing to instances within a specific VPC.
- Facilitates the use of [Amazon EC2 Auto Scaling](#) to manage and scale your EC2 capacity.

IP addresses

- Supports load balancing to VPC and on-premises resources.
- Facilitates routing to multiple IP addresses and network interfaces on the same instance.
- Offers flexibility with microservice based architectures, simplifying inter-application communication.
- Supports IPv6 targets, enabling end-to-end IPv6 communication, and IPv4-to-IPv6 NAT.

Lambda function

- Facilitates routing to a single Lambda function.
- Accessible to Application Load Balancers only.

Application Load Balancer

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aws Services Search [Alt+S]

Protocol : Port

HTTP 4000 1-65535

IP address type

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-3TIER
vpc-02af9ec2fad7ffb7c
IPv4: 10.0.0.0/16

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

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

aws Services Search [Alt+S] EC2 > Load balancers > Create Application Load Balancer

Create Application Load Balancer Info

The Application Load Balancer distributes incoming HTTP and HTTPS traffic across multiple targets such as Amazon EC2 instances, microservices, and containers, based on request attributes. When the load balancer receives a connection request, it evaluates the listener rules in priority order to determine which rule to apply, and if applicable, it selects a target from the target group for the rule action.

▶ How Elastic Load Balancing works

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
An internet-facing load balancer routes requests from clients over the internet to targets. Requires a public subnet. [Learn more](#)

Internal
An internal load balancer routes requests from clients to targets using private IP addresses.

IP address type Info
Select the type of IP addresses that your subnets use.
 IPv4
Recommended for internal load balancers.

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

aws Services Search [Alt+S] N. Virginia Subham Pradhan

VPC [Info](#)
Select the virtual private cloud (VPC) for your targets or you can [create a new VPC](#). The selected VPC can't be changed after the load balancer is created. To confirm the VPC for your targets, view your [target groups](#).

VPC-3TIER
vpc-02af9ec2fad7ffb7c
IPv4: 10.0.0.0/16

Mappings [Info](#)
Select at least two Availability Zones and one subnet per zone. The load balancer routes traffic to targets in these Availability Zones only. Availability Zones that are not supported by the load balancer or the VPC are not available for selection.

us-east-1a (use1-az2)
Subnet
subnet-03a5ca24269152655 Private-App-Subnet-AZ-1

IPv4 address
Assigned from CIDR 10.0.2.0/24

us-east-1b (use1-az4)
Subnet
subnet-0489fc8af0c95e8c2 Private-App-Subnet-AZ-2

IPv4 address
Assigned from CIDR 10.0.3.0/24

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](#).

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

aws Services Search [Alt+S] N. Virginia Subham Pradhan

Security groups
Select up to 5 security groups Internal-lb-sg sg-0704448da1f4846fb VPC: vpc-02af9ec2fad7ffb7c

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 Remove

Protocol	Port	Default action
HTTP	: 80 1-65535	Forward to AppTierTG Target type: Instance, IPv4 HTTP C Create target group

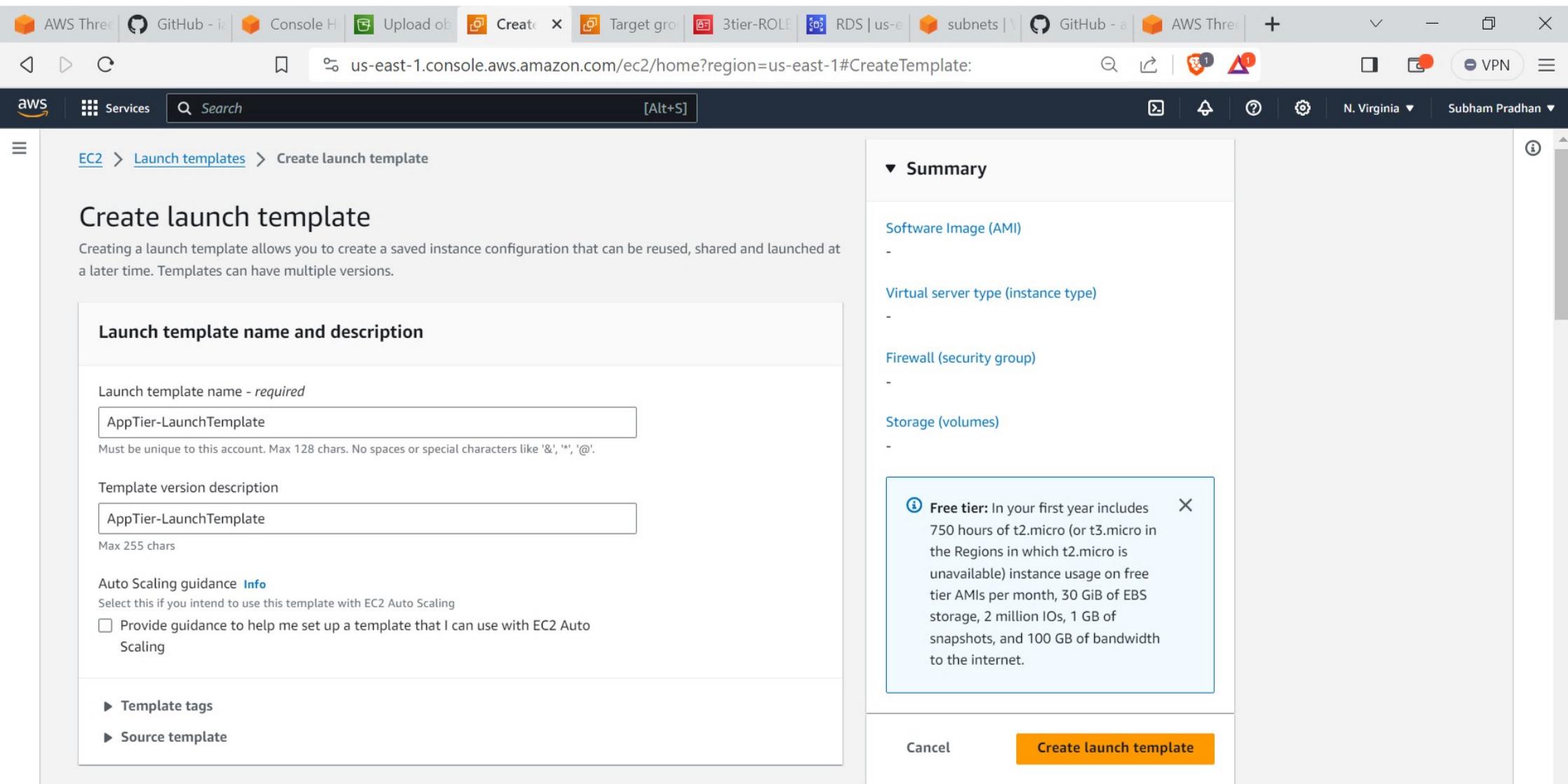
Listener tags - *optional*
Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.

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

Add listener

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us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateTemplate: [Alt+S]

aws Services Search [Alt+S] N. Virginia Subham Pradhan

applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

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

Recents My AMIs Quick Start

Don't include in launch template Owned by me Shared with me

Browse more AMIs Including AMIs from AWS, Marketplace and the Community

Amazon Machine Image (AMI)

AppTierimage
ami-064635e63f4b41c04
2023-11-26T07:00:48.000Z Virtualization: hvm ENA enabled: true Root device type: ebs

Description AppTierimage

Architecture x86_64 AMI ID ami-064635e63f4b41c04

▼ Instance type Info Advanced

Cancel Create launch template

▼ Summary

Software Image (AMI)
AppTierimage
ami-064635e63f4b41c04

Virtual server type (instance type)

Firewall (security group)

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

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

AWS Three GitHub - ic Console H Upload ob Create Target gro 3tier-ROLE RDS | us-e subnets GitHub - a AWS Three + VPN

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateTemplate: [Alt+S]

aws Services Search N. Virginia Subham Pradhan

Instance type Info

Manually select instance type
Select an instance type that meets your computing, memory, networking, or storage needs

Specify instance type attributes
Specify instance attributes that match your compute requirements

Simple

Instance type: t2.micro

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

On-Demand Windows base pricing: 0.0162 USD per Hour

On-Demand SUSE base pricing: 0.0116 USD per Hour

On-Demand RHEL base pricing: 0.0716 USD per Hour

On-Demand Linux base pricing: 0.0116 USD per Hour

Free tier eligible

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: test-key

Create new key pair

Network settings Info

Summary

Software Image (AMI): AppTierimage ami-064635e63f4b41c04

Virtual server type (instance type): t2.micro

Firewall (security group): -

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

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel Create launch template

AWS Three GitHub - ic Console H Upload ob Create Target gro 3tier-ROLE RDS | us-e subnets GitHub - a AWS Three + us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateTemplate: Search [Alt+S] Services N. Virginia Subham Pradhan

Network settings

Subnet [Info](#)
Don't include in launch template [Create new subnet](#)

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

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
Private-instance-sg sg-0ecde1e7554abff3e X
VPC: vpc-02af9ec2fad7fffb7c

Compare security group rules

Advanced network configuration

Storage (volumes) [Info](#)

EBS Volumes

Summary

Software Image (AMI)
AppTierimage
ami-064635e63f4b41c04

Virtual server type (instance type)
t2.micro

Firewall (security group)
Private-instance-sg

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

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel [Create launch template](#)

AWS Three GitHub - ic Console H Upload ob Create Target gro 3tier-ROLE RDS | us-e subnets GitHub - a AWS Three + VPN

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

aws Services Search [Alt+S] N. Virginia Subham Pradhan

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

Advanced details [Info](#)

IAM instance profile [Info](#)

3tier-ROLE-IAM
arn:aws:iam::782921506756:instance-profile/3tier-ROLE-IAM

Create new IAM profile [Edit](#)

Specify a custom value...

Don't include in launch template

3tier-ROLE-IAM
arn:aws:iam::782921506756:instance-profile/3tier-ROLE-IAM

AmazonSSMRoleForInstancesQuickSetup
arn:aws:iam::782921506756:instance-profile/AmazonSSMRoleForInstancesQuickSetup

Instance auto-recovery [Info](#)

Don't include in launch template

Shutdown behavior [Info](#)

Don't include in launch template

Stop - Hibernate behavior [Info](#)

Don't include in launch template

Termination protection [Info](#)

Summary

Software Image (AMI)
AppTierimage
ami-064635e63f4b41c04

Virtual server type (instance type)
t2.micro

Firewall (security group)
Private-instance-sg

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

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet. [X](#)

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

AWS Three GitHub - ic Console H Upload ob Create Target gro 3tier-ROLE RDS | us-e subnets | GitHub - a AWS Three + VPN

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup: Search [Alt+S] Services N. Virginia Subham Pradhan

EC2 > Auto Scaling groups > Create Auto Scaling group

Step 1 Choose launch template

Step 2 Choose instance launch options

Step 3 - optional Configure advanced options

Step 4 - optional Configure group size and scaling

Step 5 - optional Add notifications

Step 6 - optional Add tags

Step 7 Review

Choose launch template Info

Specify a launch template that contains settings common to all EC2 instances that are launched by this Auto Scaling group.

Name

Auto Scaling group name
Enter a name to identify the group.

Must be unique to this account in the current Region and no more than 255 characters.

Launch template Info

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
Choose a launch template that contains the instance-level settings, such as the Amazon Machine Image (AMI), instance type, key pair, and security groups.
 C

Create a launch template

Version

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Type here to search 1 30°C Haze 12:45 PM 26-11-2023 ENG

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us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup: [Alt+S]

aws Services Search Step 5 - optional Add notifications Step 6 - optional Add tags Step 7 Review

Network Info

For most applications, you can use multiple Availability Zones and let EC2 Auto Scaling balance your instances across the zones. The default VPC and default subnets are suitable for getting started quickly.

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

vpc-02af9ec2fad7ffb7c (VPC-3TIER)
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

us-east-1a | subnet-03a5ca24269152655 (Private- App-Subnet-AZ-1)
10.0.2.0/24

us-east-1b | subnet-0489fc8af0c95e8c2 (Private- App-Subnet-AZ-2)
10.0.3.0/24

Create a subnet

Cancel Skip to review Previous Next



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us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup: [Alt+S]

aws Services Search N. Virginia Subham Pradhan

Configure group size and scaling

Step 5 - optional Add notifications

Step 6 - optional Add tags

Step 7 Review

you define.

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 that you want to attach to your Auto Scaling group.

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

AppTierTG | HTTP X Application Load Balancer: App-tier-internal-lb

VPC Lattice integration options Info

To improve networking capabilities and scalability, integrate your Auto Scaling group with VPC Lattice. VPC Lattice facilitates communications between AWS services and helps you connect and manage your applications across compute services in AWS.

Select VPC Lattice service to attach

No VPC Lattice service VPC Lattice will not manage your Auto Scaling group's

Attach to VPC Lattice service Incoming requests associated with specified VPC Lattice

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us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup: [Alt+S]

aws Services Search N. Virginia Subham Pradhan

Configure advanced options

Step 4 - optional
Configure group size and scaling

Step 5 - optional
Add notifications

Step 6 - optional
Add tags

Step 7
[Review](#)

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 Info
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.

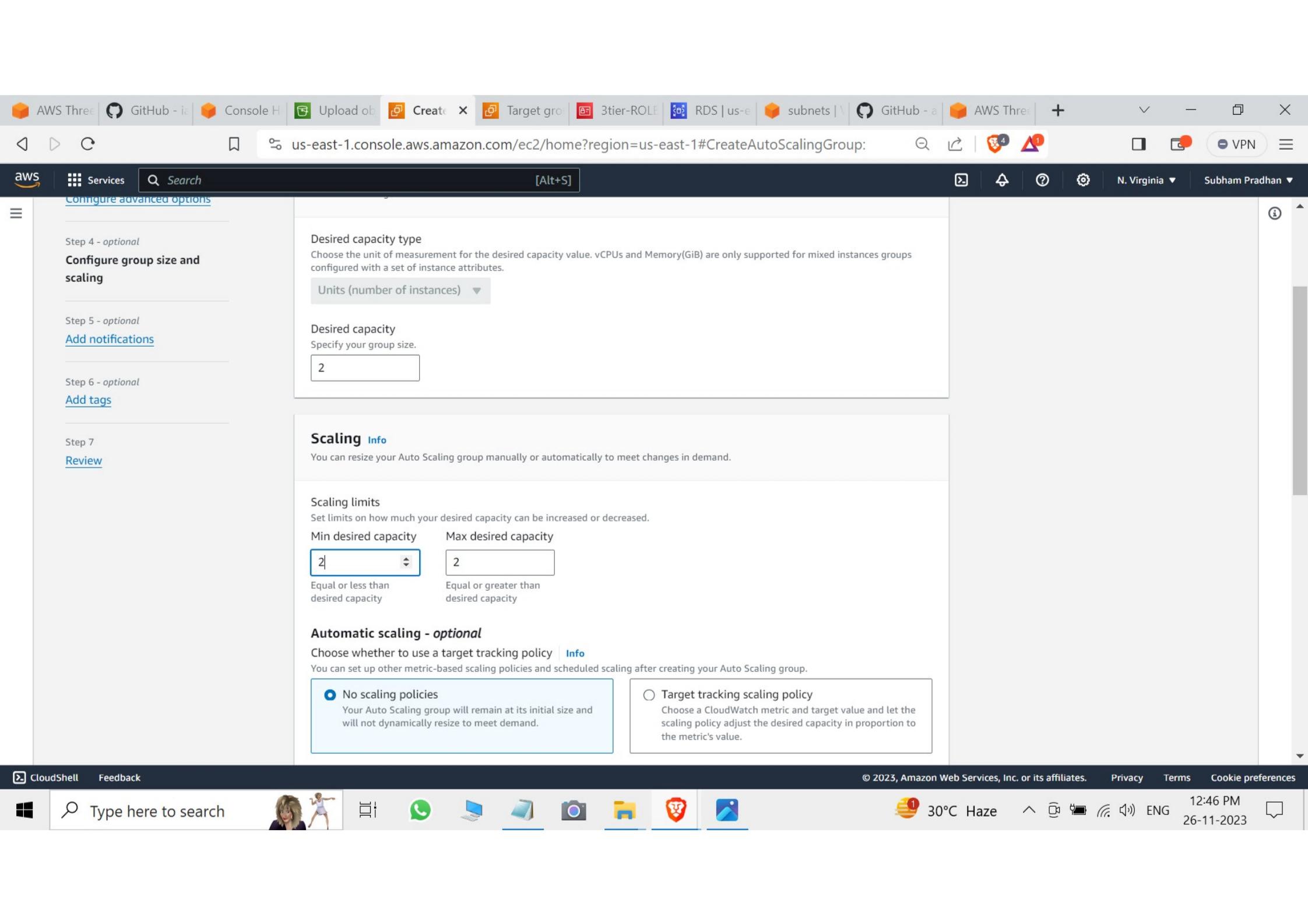
Min desired capacity: 2
Max desired capacity: 2

Equal or less than desired capacity Equal or greater than desired capacity

Automatic scaling - optional
Choose whether to use a target tracking policy | [Info](#)
You can set up other metric-based scaling policies and scheduled scaling after creating your Auto Scaling group.

No scaling policies
Your Auto Scaling group will remain at its initial size and will not dynamically resize to meet demand.

Target tracking scaling policy
Choose a CloudWatch metric and target value and let the scaling policy adjust the desired capacity in proportion to the metric's value.



Type here to search



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Session ID: root-021350098dc616474

Instance ID: i-0d903cbc434883887

Terminate

```
[ec2-user@ip-10-0-2-223 ~]$ cd app-tier/  
[ec2-user@ip-10-0-2-223 app-tier]$ npm install
```

added 68 packages, and audited 69 packages in 2s

2 packages are looking for funding
run `npm fund` for details

3 **high** severity vulnerabilities

To address all issues, run:
npm audit fix

Run `npm audit` for details.

```
[ec2-user@ip-10-0-2-223 app-tier]$ pm2 start index.js  
[PM2] Applying action restartProcessId on app [index] (ids: [ 0 ])  
[PM2] [index] (0) ✓  
[PM2] Process successfully started
```

id	name	mode	�	status	cpu	memory
0						
0	index	fork	15	online	0%	14.1mb

```
[ec2-user@ip-10-0-2-223 app-tier]$ pm2 list
```

id	name	mode	�	status	cpu	memory
0	index	fork	15	online	0%	14.1mb





```
LimitCORE=infinity
Environment=PATH=/home/ec2-user/.nvm/versions/node/v16.20.2/bin:/sbin:/bin:/usr/sbin:/usr/bin:/home/ec2-user/.nvm/versions/node/v16.20.2/bin:/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin
Environment=PM2_HOME=/home/ec2-user/.pm2
PIDFile=/home/ec2-user/.pm2/pm2.pid
Restart=on-failure

ExecStart=/home/ec2-user/.nvm/versions/node/v16.20.2/lib/node_modules/pm2/bin/pm2 resurrect
ExecReload=/home/ec2-user/.nvm/versions/node/v16.20.2/lib/node_modules/pm2/bin/pm2 reload all
ExecStop=/home/ec2-user/.nvm/versions/node/v16.20.2/lib/node_modules/pm2/bin/pm2 kill

[Install]
WantedBy=multi-user.target

Target path
/etc/systemd/system/pm2-ec2-user.service
Command list
[ 'systemctl enable pm2-ec2-user' ]
[PM2] Writing init configuration in /etc/systemd/system/pm2-ec2-user.service
[PM2] Making script booting at startup...
[PM2] [-] Executing: systemctl enable pm2-ec2-user...
[PM2] [v] Command successfully executed.
+-----+
[PM2] Freeze a process list on reboot via:
$ pm2 save

[PM2] Remove init script via:
$ pm2 unstartup systemd
[ec2-user@ip-10-0-2-223 app-tier]$ pm2 save
[PM2] Saving current process list...
[PM2] Successfully saved in /home/ec2-user/.pm2/dump.pm2
[ec2-user@ip-10-0-2-223 app-tier]$
```



MINGW64:/c/Users/ASUS/Downloads/3tier/aws-three-tier-web-architecture-workshop/application-code

```
ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads
$ pwd
/c/Users/ASUS/Downloads

ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads
$ ls

ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads
$ cd 3tier

ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier
$ ls -lrt
total 4
drwxr-xr-x 1 ASUS 197121 0 Nov 26 10:14 aws-three-tier-web-architecture-workshop
/

ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier
$ cd aws-three-tier-web-architecture-workshop/

ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier/aws-three-tier-web-architecture-w
orkshop (main)
$ ls -lrt
total 13
-rw-r--r-- 1 ASUS 197121 313 Nov 26 10:14 CODE_OF_CONDUCT.md
-rw-r--r-- 1 ASUS 197121 3219 Nov 26 10:14 CONTRIBUTING.md
-rw-r--r-- 1 ASUS 197121 2045 Nov 26 10:14 README.md
-rw-r--r-- 1 ASUS 197121 942 Nov 26 10:14 LICENSE
drwxr-xr-x 1 ASUS 197121 0 Nov 26 10:14 application-code

ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier/aws-three-tier-web-architecture-w
orkshop (main)
$ cd application-code/

ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier/aws-three-tier-web-architecture-w
orkshop/application-code (main)
$ ls -lrt
total 8
drwxr-xr-x 1 ASUS 197121 0 Nov 26 10:14 app-tier/
-rw-r--r-- 1 ASUS 197121 2590 Nov 26 10:14 nginx.conf
drwxr-xr-x 1 ASUS 197121 0 Nov 26 10:14 web-tier/

ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier/aws-three-tier-web-architecture-w
orkshop/application-code (main)
$ vi nginx.conf

ASUS@LAPTOP-Q9QDRNKO MINGW64 ~/Downloads/3tier/aws-three-tier-web-architecture-workshop/application-code (main)
```



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AWS Thread GitHub - AWS Console 3tier-pro EC2 Systems Target group 3tier-ROI RDS | us- subnets GitHub - AWS Thread + VPN

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

aws Services Search [Alt+S] N. Virginia Subham Pradhan

EC2 > Instances > Launch an instance

Launch an instance Info

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags Info

Name Add additional tags

Application and OS Images (Amazon Machine Image) Info

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

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

Recents My AMIs **Quick Start**

Amazon Linux macOS Ubuntu Windows Red Hat SUSE Li

Summary

Number of instances Info

Software Image (AMI)
Amazon Linux 2 Kernel 5.10 AMI...read more
ami-0fa1ca9559f1892ec

Virtual server type (instance type)
t2.micro

Firewall (security group)
New security group

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

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month. 30 GiB of EBS

Cancel **Launch instance** Review commands

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AWS Thread GitHub - AWS Console 3tier-pro EC2 Systems Target gr 3tier-ROI RDS | us- subnets GitHub - AWS Thread + us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances: Search [Alt+S] Services N. Virginia Subham Pradhan

VPC - required [Info](#)
vpc-02af9ec2fad7ffb7c (VPC-3TIER)
10.0.0.0/16

Subnet Info
subnet-0622093a71429752e Public-Web-Subnet-AZ-1
VPC: vpc-02af9ec2fad7ffb7c Owner: 782921506756 Availability Zone: us-east-1a
IP addresses available: 249 CIDR: 10.0.0.0/24

Create new subnet

Auto-assign public IP [Info](#)
Enable

Firewall (security groups) [Info](#)
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.
 Create security group Select existing security group

Common security groups [Info](#)
Select security groups
WebTier-sg sg-054a20c0515fe73de X
VPC: vpc-02af9ec2fad7ffb7c

Compare security group rules

Security groups that you add or remove here will be added to or removed from all your network interfaces.

Advanced network configuration

Configure storage [Info](#) Advanced

Summary

Number of instances [Info](#)
1

Software Image (AMI)
Amazon Linux 2 Kernel 5.10 AMI...read more
ami-0fa1ca9559f1892ec

Virtual server type (instance type)
t2.micro

Firewall (security group)
WebTier-sg

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

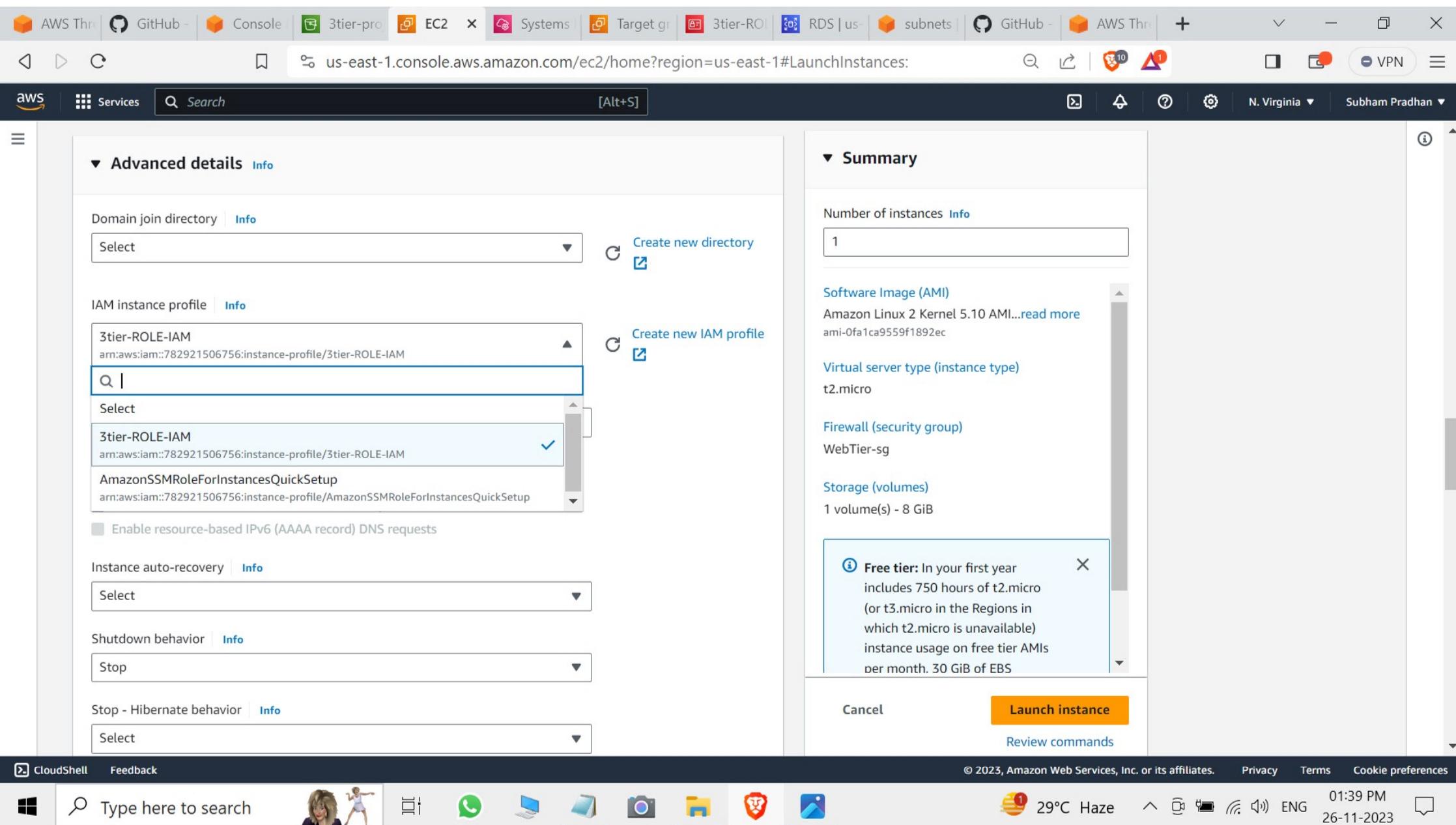
Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month. 30 GiB of EBS

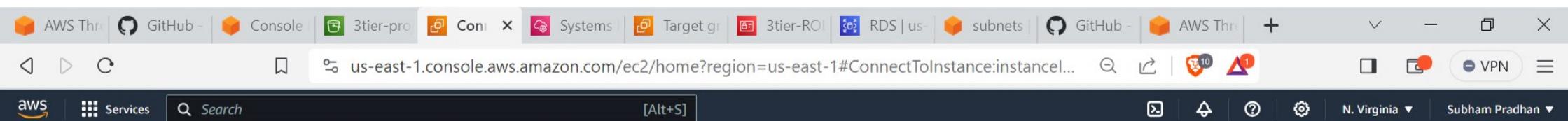
Cancel Launch instance Review commands

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EC2 > Instances > i-0e2239540c88a807e > Connect to instance

Connect to instance Info

Connect to your instance i-0e2239540c88a807e (Demo-Web-server) using any of these options

EC2 Instance Connect Session Manager SSH client EC2 serial console

Session Manager usage:

- Connect to your instance without SSH keys, a bastion host, or opening any inbound ports.
- Sessions are secured using an AWS Key Management Service key.
- You can log session commands and details in an Amazon S3 bucket or CloudWatch Logs log group.
- Configure sessions on the Session Manager [Preferences](#) page.

Cancel

Connect





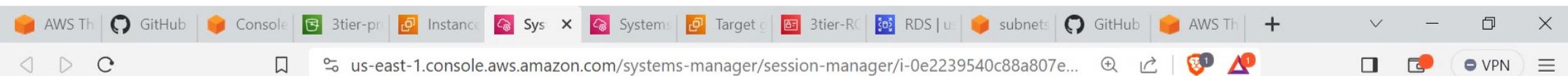
Session ID: root-0d2f03c8b394d4362

Instance ID: i-0e2239540c88a807e

Terminate

```
sh-4.2$ sudo -su ec2-user
[ec2-user@ip-10-0-0-112 bin]$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=116 time=1.06 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=116 time=1.14 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=116 time=1.17 ms
^C
--- 8.8.8.8 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2002ms
rtt min/avg/max/mdev = 1.069/1.130/1.176/0.044 ms
[ec2-user@ip-10-0-0-112 bin]$ █
```





```
[ec2-user@ip-10-0-0-112 bin]$ curl -o- https://raw.githubusercontent.com/nvm-sh/nvm/v0.38.0/install.sh | bash
% Total    % Received % Xferd  Average Speed   Time     Time      Time  Current
                                         Dload  Upload   Total   Spent    Left  Speed
100 14926  100 14926    0     0  169k      0 --:--:-- --:--:-- --:--:--  171k
=> Downloading nvm as script to '/home/ec2-user/.nvm'

=> Appending nvm source string to /home/ec2-user/.bashrc
=> Appending bash_completion source string to /home/ec2-user/.bashrc
=> Close and reopen your terminal to start using nvm or run the following to use it now:

export NVM_DIR="$HOME/.nvm"
[ -s "$NVM_DIR/nvm.sh" ] && \. "$NVM_DIR/nvm.sh" # This loads nvm
[ -s "$NVM_DIR/bash_completion" ] && \. "$NVM_DIR/bash_completion" # This loads nvm bash_completion
[ec2-user@ip-10-0-0-112 bin]$ source ~/.bashrc
[ec2-user@ip-10-0-0-112 bin]$ nvm install 16
Downloading and installing node v16.20.2...
Downloading https://nodejs.org/dist/v16.20.2/node-v16.20.2-linux-x64.t
ar.xz...
#####
##### 100.0%
Computing checksum with sha256sum
Checksums matched!
Now using node v16.20.2 (npm v8.19.4)
Creating default alias: default -> 16 (-> v16.20.2)
[ec2-user@ip-10-0-0-112 bin]$ nvm use 16
Now using node v16.20.2 (npm v8.19.4)
[ec2-user@ip-10-0-0-112 bin]$ npm install -g pm2
npm WARN deprecated uid@3.4.0: Please upgrade to version 7 or higher
```



AWS Th GitHub Console 3tier-pr Instance Sys Systems Target g 3tier-RCS RDS | subnets GitHub AWS Th +

us-east-1.console.aws.amazon.com/systems-manager/session-manager/i-0e2239540c88a807e...

VPN

Session ID: root-0d2f03c8b394d4362

Instance ID: i-0e2239540c88a807e

Terminate

```
Checksums matched!
Now using node v16.20.2 (npm v8.19.4)
Creating default alias: default -> 16 (-> v16.20.2)
[ec2-user@ip-10-0-0-112 bin]$ nvm use 16
Now using node v16.20.2 (npm v8.19.4)
[ec2-user@ip-10-0-0-112 bin]$ npm install -g pm2
npm [WARN] deprecated uuid@3.4.0: Please upgrade to version 7 or higher
. Older versions may use Math.random() in certain circumstances, which is known to be problematic. See https://v8.dev/blog/math-random for details.

added 157 packages, and audited 158 packages in 8s

13 packages are looking for funding
  run `npm fund` for details

2 moderate severity vulnerabilities

Some issues need review, and may require choosing
a different dependency.

Run `npm audit` for details.
npm notice
npm notice New major version of npm available! 8.19.4 -> 10.2.4
npm notice Changelog: https://github.com/npm/cli/releases/tag/v10.2.4
npm notice Run npm install -g npm@10.2.4 to update!
npm notice
```



29°C Haze 01:44 PM
26-11-2023 ENG



```
sh-4.2$ sudo -su ec2-user
[ec2-user@ip-10-0-0-112 bin]$ curl -o- https://raw.githubusercontent.com/nvm-sh/nvm/v0.38.0/install.sh | bash
% Total    % Received % Xferd  Average Speed   Time     Time     Time  Current
                                         Dload  Upload   Total   Spent    Left  Speed
  0      0     0      0      0       0      0 --:--:-- --:--:-- --:--:-- 165
100 14926  100 14926      0       0   164k      0 --:--:-- --:--:-- --:--:-- 165
k
=> nvm is already installed in /home/ec2-user/.nvm, trying to update the scri
pt

=> nvm source string already in /home/ec2-user/.bashrc
=> bash_completion source string already in /home/ec2-user/.bashrc
=> Close and reopen your terminal to start using nvm or run the following to
use it now:

export NVM_DIR="$HOME/.nvm"
[ -s "$NVM_DIR/nvm.sh" ] && \. "$NVM_DIR/nvm.sh" # This loads nvm
[ -s "$NVM_DIR/bash_completion" ] && \. "$NVM_DIR/bash_completion" # This lo
ads nvm bash_completion
[ec2-user@ip-10-0-0-112 bin]$ source ~/.bashrc
[ec2-user@ip-10-0-0-112 bin]$ nvm install 16
v16.20.2 is already installed.
^[[A^[[DNow using node v16.20.2 (npm v8.19.4)
[ec2-user@ip-10-0-0-112 bin]$ nvm use 16
Now using node v16.20.2 (npm v8.19.4)
[ec2-user@ip-10-0-0-112 bin]$ npm install -g pm2
npm WARN deprecated uuid@3.4.0: Please upgrade to version 7 or higher. Olde
r versions may use Math.random() in certain circumstances, which is known to
be problematic. See https://v8.dev/blog/math-random for details.
```



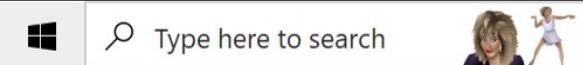


Session ID: root-00fa06d3d336261f7

Instance ID: i-0e2239540c88a807e

Terminate

```
Run `npm audit` for details.  
[ec2-user@ip-10-0-0-112 bin]$ cd ~/  
[ec2-user@ip-10-0-0-112 ~]$ aws s3 cp s3://3tier-project-bucket/web-tier/ web-  
tier --recursive  
Completed 1.5 KiB/~196.4 KiB (14.4 KiB/s) with ~14 file(s) remaining (calcula  
download: s3://3tier-project-bucket/web-tier/public/index.html to web-tier/pu  
blic/index.html  
Completed 1.5 KiB/~196.4 KiB (14.4 KiB/s) with ~13 file(s) remaining (calcula  
Completed 1.5 KiB/~203.6 KiB (13.1 KiB/s) with ~20 file(s) remaining (calcula  
download: s3://3tier-project-bucket/web-tier/README.md to web-tier/README.md  
  
Completed 1.5 KiB/~203.6 KiB (13.1 KiB/s) with ~19 file(s) remaining (calcula  
Completed 1.6 KiB/205.6 KiB (12.9 KiB/s) with 25 file(s) remaining  
download: s3://3tier-project-bucket/web-tier/public/robots.txt to web-tier/pu  
blic/robots.txt  
download: s3://3tier-project-bucket/web-tier/src/.DS_Store to web-tier/src/.D  
S_Store  
download: s3://3tier-project-bucket/web-tier/src/components/DatabaseDemo/Data  
baseDemo.js to web-tier/src/components/DatabaseDemo/DatabaseDemo.js  
download: s3://3tier-project-bucket/web-tier/package.json to web-tier/package  
.json  
download: s3://3tier-project-bucket/web-tier/src/components/DatabaseDemo/Data  
baseDemo.css to web-tier/src/components/DatabaseDemo/DatabaseDemo.css  
download: s3://3tier-project-bucket/web-tier/src/components/Home/Home.js to w  
eb-tier/src/components/Home/Home.js  
download: s3://3tier-project-bucket/web-tier/src/components/.DS_Store to web-  
tier/src/components/.DS_Store  
download: s3://3tier-project-bucket/web-tier/src/App.css to web-tier/src/App.  
css  
download: s3://3tier-project-bucket/web-tier/src/components/Menu/index.js to  
web-tier/src/components/Menu/index.js  
download: s3://3tier-project-bucket/web-tier/src/components/Menu/Menu.styled.
```





```
er/src/reportWebVitals.js
download: s3://3tier-project-bucket/web-tier/src/assets/3TierArch.png to web-
tier/src/assets/3TierArch.png
download: s3://3tier-project-bucket/web-tier/src/components/Burger/Burger.sty
led.js to web-tier/src/components/Burger/Burger.styled.js
[ec2-user@ip-10-0-0-112 ~]$ cd ~/web-tier
[ec2-user@ip-10-0-0-112 web-tier]$ npm install

changed 1 package, and audited 1494 packages in 7s

248 packages are looking for funding
  run `npm fund` for details

8 vulnerabilities (2 moderate, 6 high)

To address all issues (including breaking changes), run:
  npm audit fix --force

Run `npm audit` for details.
[ec2-user@ip-10-0-0-112 web-tier]$ npm run build

> aws-3tier-web-layer@0.1.0 build
> react-scripts build

Creating an optimized production build...
Compiled successfully.

File sizes after gzip:

73.84 kB  build/static/js/main.54dba04e.js
1.79 kB   build/static/js/787.24ed0841.chunk.js
493 B     build/static/css/main.b20b6ac4.css
```





Session ID: root-00fa06d3d336261f7

Instance ID: i-0e2239540c88a807e

Terminate

```
70  unbound1.17          available      [ =stable ]
72  collectd-python3     available      [ =stable ]
+ Note on end-of-support. Use 'info' subcommand.
[ec2-user@ip-10-0-0-112 web-tier]$ cd /etc/nginx/
[ec2-user@ip-10-0-0-112 nginx]$ sudo cp nginx.conf nginx.conf_bkp
[ec2-user@ip-10-0-0-112 nginx]$ aws s3 cp s3://3tier-project-bucket/nginx.conf .
download failed: s3://3tier-project-bucket/nginx.conf to ./nginx.conf [Errno
13] Permission denied: u'/etc/nginx/nginx.conf.c8Cb3e46'
[ec2-user@ip-10-0-0-112 nginx]$ sudo service nginx restart
Redirecting to /bin/systemctl restart nginx.service
[ec2-user@ip-10-0-0-112 nginx]$ vi nginx.conf
[ec2-user@ip-10-0-0-112 nginx]$ sudo service nginx status
Redirecting to /bin/systemctl status nginx.service
● nginx.service - The nginx HTTP and reverse proxy server
   Loaded: loaded (/usr/lib/systemd/system/nginx.service; disabled; vendor preset: disabled)
   Active: active (running) since Sun 2023-11-26 09:09:43 UTC; 5min ago
     Process: 2387 ExecStart=/usr/sbin/nginx (code=exited, status=0/SUCCESS)
     Process: 2383 ExecStartPre=/usr/sbin/nginx -t (code=exited, status=0/SUCCESS)
     Process: 2382 ExecStartPre=/usr/bin/rm -f /run/nginx.pid (code=exited, status=0/SUCCESS)
   Main PID: 2389 (nginx)
  CGroup: /system.slice/nginx.service
          ├─2389 nginx: master process /usr/sbin/nginx
          └─2390 nginx: worker process
```

```
Nov 26 09:09:43 ip-10-0-0-112.ec2.internal systemd[1]: Starting The nginx HTTP and reverse proxy server...
Nov 26 09:09:43 ip-10-0-0-112.ec2.internal nginx[2383]: nginx: the configuration file /etc/nginx/nginx.conf syntax is ok
Nov 26 09:09:43 ip-10-0-0-112.ec2.internal nginx[2383]: nginx: configuration file /etc/nginx/nginx.conf test is successful
Nov 26 09:09:43 ip-10-0-0-112.ec2.internal systemd[1]: Started The nginx HTTP and reverse proxy server.
[ec2-user@ip-10-0-0-112 nginx]$ chmod -R 755 /home/ec2-user
[ec2-user@ip-10-0-0-112 nginx]$ sudo chkconfig nginx on
Note: Forwarding request to 'systemctl enable nginx.service'.
```





```
Nov 26 09:09:43 ip-10-0-0-112.ec2.internal nginx[2383]: nginx: the configuration file /etc/nginx/nginx.conf syntax is ok
Nov 26 09:09:43 ip-10-0-0-112.ec2.internal nginx[2383]: nginx: configuration file /etc/nginx/nginx.conf test is successful
Nov 26 09:09:43 ip-10-0-0-112.ec2.internal systemd[1]: Started The nginx HTTP and reverse proxy server.
[ec2-user@ip-10-0-0-112 nginx]$ chmod -R 755 /home/ec2-user
[ec2-user@ip-10-0-0-112 nginx]$ sudo chkconfig nginx on
Note: Forwarding request to 'systemctl enable nginx.service'.
Created symlink from /etc/systemd/system/multi-user.target.wants/nginx.service to /usr/lib/systemd/system/nginx.service.
[ec2-user@ip-10-0-0-112 nginx]$ curl localhost:80
<!DOCTYPE html>
<html>
<head>
<title>Welcome to nginx!</title>
<style>
html { color-scheme: light dark; }
body { width: 35em; margin: 0 auto;
font-family: Tahoma, Verdana, Arial, sans-serif; }
</style>
</head>
<body>
<h1>Welcome to nginx!</h1>
<p>If you see this page, the nginx web server is successfully installed and
working. Further configuration is required.</p>

<p>For online documentation and support please refer to
<a href="http://nginx.org/">nginx.org</a>.<br/>
Commercial support is available at
<a href="http://nginx.com/">nginx.com</a>.</p>

<p><em>Thank you for using nginx.</em></p>
</body>
</html>
[ec2-user@ip-10-0-0-112 nginx]$
```



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us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:search=:Running;v... | Search | [Alt+S] | N. Virginia | Subham Pradhan

Instances (1/4) [Info](#)

Find Instance by attribute or tag (case-sensitive)

Running [X](#) [Clear filters](#)

Name	Instance ID	Instance state	Instance type	Status check	Alarm status
<input checked="" type="checkbox"/> Demo-Web-se...	i-0e2239540c88a807e	Running	t2.micro	2/2 checks pass	No alarms +
<input type="checkbox"/>	i-0d9d6db735518809a	Running	t2.micro	2/2 checks pass	No alarms +

Actions ▾ [Launch instances](#)

- Connect
- [View details](#)
- [Manage instance state](#)
- [Instance settings](#) ► DNS
- [Networking](#)
- [Security](#)
- [Image and templates](#)
- [Monitor and troubleshoot](#)

Instance: i-0e2239540c88a807e (Demo-Web-server)

Details Security Networking Storage Status checks Monitoring Tags

Instance summary [Info](#)

Instance ID	Public IPv4 address	Private IPv4 addresses
i-0e2239540c88a807e (Demo-Web-server)	18.204.205.202 open address	10.0.0.112
IPv6 address	Instance state	Public IPv4 DNS
-	Running	-
Hostname type	Private IP DNS name (IPv4 only)	Elastic IP addresses
IP name: ip-10-0-0-112.ec2.internal	ip-10-0-0-112.ec2.internal	-
Answer private resource DNS name	Instance type	
	t2.micro	

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Type here to search

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EC2 > Instances > i-0e2239540c88a807e > Create image

Create image Info

An image (also referred to as an AMI) defines the programs and settings that are applied when you launch an EC2 instance. You can create an image from the configuration of an existing instance.

Instance ID

[i-0e2239540c88a807e](#) (Demo-Web-server)

Image name

WebServerImage

Maximum 127 characters. Can't be modified after creation.

Image description - optional

WebServerImage

Maximum 255 characters

No reboot

Enable

Instance volumes

Storage type	Device	Snapshot	Size	Volume type	IOPS	Throughput	Delete on termination	Encrypted
--------------	--------	----------	------	-------------	------	------------	-----------------------	-----------



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AWS GitHub Cons 3tier- S System System Load 3tier- RDS subn GitHub AWS Full E ask server +

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

aws Services Search [Alt+S] N. Virginia Subham Pradhan

EC2 > Target groups > Create target group

Step 1 Specify group details

Your load balancer routes requests to the targets in a target group and performs health checks on the targets.

Step 2 Register targets

Basic configuration
Settings in this section can't be changed after the target group is created.

Choose a target type

Instances

- Supports load balancing to instances within a specific VPC.
- Facilitates the use of [Amazon EC2 Auto Scaling](#) to manage and scale your EC2 capacity.

IP addresses

- Supports load balancing to VPC and on-premises resources.
- Facilitates routing to multiple IP addresses and network interfaces on the same instance.
- Offers flexibility with microservice based architectures, simplifying inter-application communication.
- Supports IPv6 targets, enabling end-to-end IPv6 communication, and IPv4-to-IPv6 NAT.

Lambda function

- Facilitates routing to a single Lambda function.
- Accessible to Application Load Balancers only.

Application Load Balancer

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```
*3TierArchitectureEndtoEnd - Notepad
File Edit Format View Help
$ curl localhost:80

Demo Web Server - Create an Image - Webserverimage
Create Target Group - Instances - WebTierTG
HTTP - 80 - HTTP1
Health check - HTTP
Health_check_Path - /health
Targets - All

Create Load Balancer - Application Load Balancer - name-Web-tier-extern
schema - internal, IPv4
Subnet - Public-Web-Subnet-AZ-1 and Public-Web-
Security Groups - InternetFacing-lb-sg
Protocol - HTTP - 80
Select Target Group - Webserver TG

Launch Template - Web server LT
My AMIs - Owned by me (Select existing which you crea
key pair - Don't need a key pair to access
SG - WebTier-sg
Advance details - IAM role select

Auto Scaling - WebserverASG
Select Launch Template - Web server LT
VPC - Public-Web-Subnet-AZ-1 and Public-Web-Subnet-AZ-2
Attach to an existing load balancer - Web-tier-external
targets group - Webserver TG
Configure group size = 2
scaling policies = None
```

The screenshot shows the AWS CloudFormation console with the following steps completed:

- VPC:** A VPC named "VPC-3TIER" is selected, with its ID and IPv4 range (10.0.0.0/16) displayed.
- Protocol version:** HTTP1 is selected as the protocol version.
- Health checks:** The health check protocol is set to HTTP, and the path is specified as "/health".
- CloudShell:** The CloudShell tab is active, showing the command used to create the target group.

```
$ aws cloudformation create-stack --stack-name WebTierTG --template-body "{'Resources': {'WebTierTG': {'Type': 'AWS::Lambda::TargetGroup', 'Properties': {'Protocol': 'HTTP', 'Port': 80, 'VpcId': 'vpc-02af9ec2fad7ffb7c', 'HealthCheckPath': '/health'}}}}"
```

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

EC2 Dashboard Services Search [Alt+S] EC2 Target groups

Target groups (2) Info Actions Create target group

Name	ARN	Port	Protocol	Target type	Load balancer	VPC ID
WebTierTG	arn:aws:elasticloadbalancing:us-east-1:123456789012:targetgroup/WebTierTG/5555555555555555	80	HTTP	Instance	None associated	vpc-02345678901234567
AppTierTG	arn:aws:elasticloadbalancing:us-east-1:123456789012:targetgroup/AppTierTG/5555555555555555	80	HTTP	Instance	None associated	vpc-02345678901234567

0 target groups selected

Select a target group above.

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

aws Services Search [Alt+S] EC2 > Load balancers > Create Application Load Balancer

Create Application Load Balancer Info

The Application Load Balancer distributes incoming HTTP and HTTPS traffic across multiple targets such as Amazon EC2 instances, microservices, and containers, based on request attributes. When the load balancer receives a connection request, it evaluates the listener rules in priority order to determine which rule to apply, and if applicable, it selects a target from the target group for the rule action.

▶ How Elastic Load Balancing works

Basic configuration

Load balancer name

Name must be unique within your AWS account and can't be changed after the load balancer is created.

Web server LT

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

An internet-facing load balancer routes requests from clients over the internet to targets. Requires a public subnet. [Learn more](#)

Internal

An internal load balancer routes requests from clients to targets using private IP addresses.

IP address type Info

Select the type of IP addresses that your subnets use.

IPv4

Recommended for internal load balancers.

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

aws Services Search [Alt+S] N. Virginia Subham Pradhan

Network mapping Info

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

VPC Info

Select the virtual private cloud (VPC) for your targets or you can [create a new VPC](#). Only VPCs with an internet gateway are enabled for selection. The selected VPC can't be changed after the load balancer is created. To confirm the VPC for your targets, view your [target groups](#).

VPC-3TIER
vpc-02af9ec2fad7ffb7c
IPv4: 10.0.0.0/16

C

Mappings Info

Select at least two Availability Zones and one subnet per zone. The load balancer routes traffic to targets in these Availability Zones only. Availability Zones that are not supported by the load balancer or the VPC are not available for selection.

us-east-1a (use1-az2)

Subnet
subnet-0622093a71429752e Public-Web-Subnet-AZ-1

IPv4 address
Assigned by AWS

us-east-1b (use1-az4)

Subnet
subnet-0a8d6e5542317c7c7 Public-Web-Subnet-AZ-2

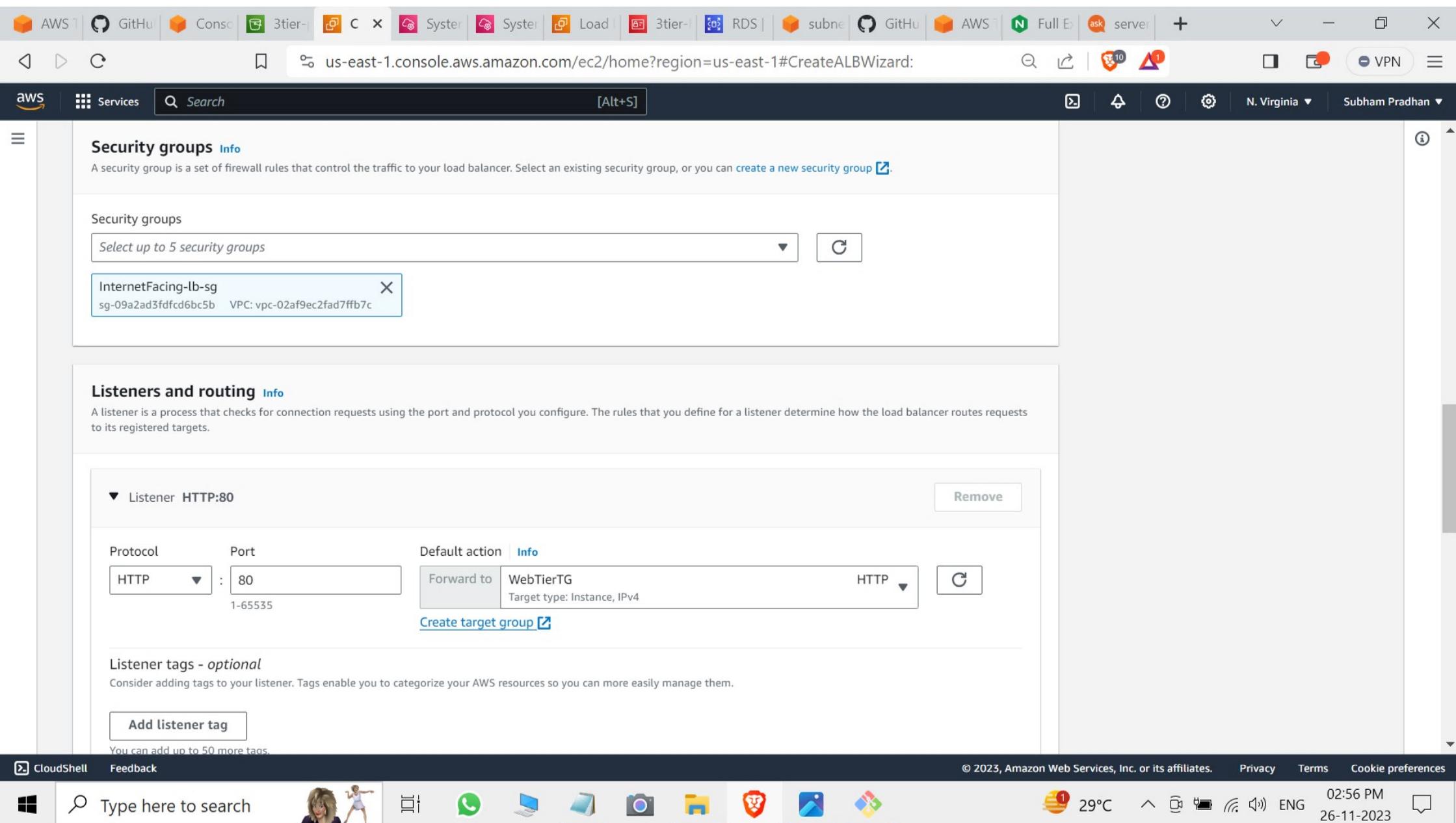
IPv4 address
Assigned by AWS

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](#).

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aws Services Search [Alt+S] EC2 Dashboard EC2 Global View Events Instances Instances Instance Types Launch Templates Spot Requests Savings Plans Reserved Instances Dedicated Hosts Capacity Reservations New Images AMIs AMI Catalog Elastic Block Store Volumes Snapshots Lifecycle Manager Network & Security

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

EC2 > Load balancers

Load balancers (2)

Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.

<input type="checkbox"/>	Name	DNS name	State	VPC ID	Availability Zones	Type	Date created
<input type="checkbox"/>	Web-server-LT	Web-server-LT-21238073...	Provisioning..	vpc-02af9ec2fad7ffb7c	2 Availability Zones	application	November 26
<input type="checkbox"/>	App-tier-internal-lb	internal-App-tier-internal-...	Active	vpc-02af9ec2fad7ffb7c	2 Availability Zones	application	November 26

Filter load balancers < 1 > Actions ▾ Create load balancer

0 load balancers selected

Select a load balancer above.

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us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateTemplate: Search Copy Share 10 1 VPN

aws Services Search [Alt+S] N. Virginia Subham Pradhan

EC2 > Launch templates > Create launch template

Create launch template

Creating a launch template allows you to create a saved instance configuration that can be reused, shared and launched at a later time. Templates can have multiple versions.

Launch template name and description

Launch template name - required
WebTier-LaunchTemplate

Must be unique to this account. Max 128 chars. No spaces or special characters like '&', '*', '@'.

Template version description
WebTier-LaunchTemplate

Max 255 chars

Auto Scaling guidance [Info](#)
Select this if you intend to use this template with EC2 Auto Scaling
 Provide guidance to help me set up a template that I can use with EC2 Auto Scaling

► Template tags
► Source template

Summary

Software Image (AMI)
-

Virtual server type (instance type)
-

Firewall (security group)
-

Storage (volumes)
-

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet. X

Cancel Create launch template

Launch template contents

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us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateTemplate: [Alt+S]

aws Services Search [Alt+S] N. Virginia Subham Pradhan

Specify the details of your launch template below. Leaving a field blank will result in the field not being included in the launch template.

▼ Application and OS Images (Amazon Machine Image) - required [Info](#)

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

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

Recents My AMIs Quick Start

Search bar: Specify a custom value...

AMIs listed:

- AppTierimage ami-064635e63f4b41c04 2023-11-26T07:00:48.000Z Virtualization: hvm ENA enabled: true Root device type: ebs
- WebServerImage ami-06b25375510e0998d 2023-11-26T09:17:52.000Z Virtualization: hvm ENA enabled: true Root device type: ebs
- WebServerImage ami-06b25375510e0998d 2023-11-26T09:17:52.000Z Virtualization: hvm ENA enabled: true Root device type: ebs

Description: WebServerImage

Architecture: x86_64 AMI ID: ami-06b25375510e0998d

▼ Summary

Software Image (AMI)
WebServerImage
ami-06b25375510e0998d

Virtual server type (instance type)

Firewall (security group)

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

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel Create launch template

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AWS GitHub Cons 3tier- C System System Load 3tier- RDS subn GitHub AWS Full E ask server + us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateTemplate: Search [Alt+S] Services N. Virginia Subham Pradhan

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: test-key Create new key pair

Network settings Info

Subnet Info: Don't include in launch template Create new subnet

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

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: WebTier-sg sg-054a20c0515fe73de VPC: vpc-02af9ec2fad7ffb7c Compare security group rules

Summary

Software Image (AMI): WebServerImage ami-06b25375510e0998d

Virtual server type (instance type): t2.micro

Firewall (security group): WebTier-sg

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

i Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

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

Services Search [Alt+S] N. Virginia Subham Pradhan

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 3tier-ROLE-IAM arn:aws:iam::782921506756:instance-profile/3tier-ROLE-IAM 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

Shutdown behavior | Info

Summary

Software Image (AMI)
WebServerImage
ami-06b25375510e0998d

Virtual server type (instance type)
t2.micro

Firewall (security group)
WebTier-sg

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

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel Create launch template

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

aws Services Search [Alt+S] Actions Create launch template

EC2 Dashboard EC2 Global View Events Instances Instances Instance Types Launch Templates Launch Templates (1/2) Info Search < 1 > Actions

Launch Template ID	Launch Template Name	Default Version	Latest Version	Create Time	Created By
lt-090fa4985b91c38f8	AppTier-LaunchTemplate	1	1	2023-11-26T07:14:39.000Z	arn:aws:iam::78292...
lt-088cb6b4c17706931	WebTier-LaunchTemplate	1	1	2023-11-26T09:29:52.000Z	arn:aws:iam::78292...

AppTier-LaunchTemplate (lt-090fa4985b91c38f8)

Launch template details Actions Delete template

Launch template ID	Launch template name	Default version	Owner
lt-090fa4985b91c38f8	AppTier-LaunchTemplate	1	arn:aws:iam::782921506756:root

Details Versions Template tags Actions Delete template version

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aws Services  Search [Alt+S]

EC2 > Auto Scaling groups > Create Auto Scaling group

Step 1
Choose launch template

Step 2
Choose instance launch options

Step 3 - optional
Configure advanced options

Step 4 - optional
Configure group size and scaling

Step 5 - optional
Add notifications

Step 6 - optional
Add tags

Step 7
Review

Choose launch template

Specify a launch template that contains settings common to all EC2 instances that are launched by this Auto Scaling group.

Name

Auto Scaling group name
Enter a name to identify the group.

Must be unique to this account in the current Region and no more than 255 characters.

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
Choose a launch template that contains the instance-level settings, such as the Amazon Machine Image (AMI), instance type, key pair, and security groups.
 
[Create a launch template](#) 
Version
  

AWS GitHub Consol 3tier- C System System Load 3tier- RDS subne GitHub AWS Full Eng ask server + VPN

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

aws Services Search [Alt+S] N. Virginia Subham Pradhan

Step 5 - optional
[Add notifications](#)

t2.micro

Step 6 - optional
[Add tags](#)

Step 7
[Review](#)

Network Info

For most applications, you can use multiple Availability Zones and let EC2 Auto Scaling balance your instances across the zones. The default VPC and default subnets are suitable for getting started quickly.

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

vpc-02af9ec2fad7ffb7c (VPC-3TIER)
10.0.0.0/16 C

[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 C

us-east-1a | subnet-0622093a71429752e (Public- Web-Subnet-AZ-1)
10.0.0.0/24

us-east-1b | subnet-0a8d6e5542317c7c7 (Public- Web-Subnet-AZ-2)
10.0.1.0/24

[Create a subnet](#)

Cancel Skip to review Previous Next



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us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup: [Alt+S]

aws Services Search N. Virginia Subham Pradhan

Step 3 - optional
[Configure advanced options](#)

Step 4 - optional
[Configure group size and scaling](#)

Step 5 - optional
[Add notifications](#)

Step 6 - optional
[Add tags](#)

Step 7
[Review](#)

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.

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 that you want to attach to your Auto Scaling group.

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 ▼ ✖

WebTierTG | HTTP ×
Application Load Balancer: Web-server-LT

VPC Lattice integration options Info

To improve networking capabilities and scalability, integrate your Auto Scaling group with VPC Lattice. VPC Lattice facilitates communications between AWS services and helps you connect and manage your applications across compute services in AWS.

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us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateAutoScalingGroup: Search [Alt+S]

aws Services Search N. Virginia Subham Pradhan

Step 5 - optional Add notifications

Desired capacity
Specify your group size.

Step 6 - optional Add tags

Step 7 Review

Scaling Info
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: Max desired capacity:
Equal or less than desired capacity Equal or greater than desired capacity

Automatic scaling - optional
Choose whether to use a target tracking policy | [Info](#)
You can set up other metric-based scaling policies and scheduled scaling after creating your Auto Scaling group.

No scaling policies
Your Auto Scaling group will remain at its initial size and will not dynamically resize to meet demand.

Target tracking scaling policy
Choose a CloudWatch metric and target value and let the scaling policy adjust the desired capacity in proportion to the metric's value.

Instance maintenance policy - new [Info](#)
Control your Auto Scaling group's availability during instance replacement events. This includes health checks, instance refreshes, maximum instance lifetime features and events that happen automatically to keep your group balanced, called rebalancing events.

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

aws Services Search [Alt+S]

EC2 Dashboard EC2 Global View Events Instances Instances Instance Types Launch Templates Spot Requests Savings Plans Reserved Instances Dedicated Hosts Capacity Reservations New Images AMIs AMI Catalog Elastic Block Store Volumes Snapshots Lifecycle Manager Network & Security

EC2 > Auto Scaling groups

Auto Scaling groups (2) Info C Launch configurations Launch templates Actions Create Auto Scaling group

Search your Auto Scaling groups

Name	Launch template/configuration	Instances	Status	Desired capacity	Min	Max
WebserverASG	WebTier-LaunchTemplate Version Default	2	-	2	2	2
AppserverASG	AppTier-LaunchTemplate Version Default	2	-	2	2	2

0 Auto Scaling groups selected

Select an Auto Scaling group

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

aws Services Search [Alt+S]

Capacity Reservations New

Images AMIs AMI Catalog

Elastic Block Store Volumes Snapshots Lifecycle Manager

Network & Security Security Groups Elastic IPs Placement Groups Key Pairs Network Interfaces

Load Balancing Load Balancers Target Groups

Auto Scaling Auto Scaling Groups

EC2 > Load balancers

Load balancers (1/2)

Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.

Filter load balancers

Name	DNS name	State	VPC ID	Availability Zones	Type	Date created
<input checked="" type="checkbox"/> Web-server-LT	Web-server-LT-21238073...	Active	vpc-02af9ec2fad7ffb7c	2 Availability Zones	application	November 26
<input type="checkbox"/> App-tier-internal-lb	internal-App-tier-internal-...	Active	vpc-02af9ec2fad7ffb7c	2 Availability Zones	application	November 26

Load balancer: Web-server-LT

Application	Active	vpc-02af9ec2fad7ffb7c	IPv4
Scheme	Hosted zone	Availability Zones	Date created
Internet-facing	Z35SXDOTRQ7X7K	subnet-0a8d6e5542317c7c7 us-east-1b (use1-az4)	November 26, 2023, 14:57 (UTC+05:30)
		subnet-0622093a71429752e us-east-1a (use1-az2)	

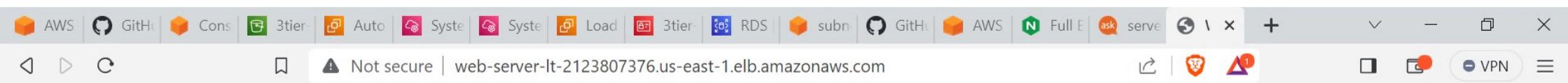
Load balancer ARN: arn:aws:elasticloadbalancing:us-east-1:782921506756:loadbalancer/app/Web-server-LT/d13d803b84ab34df

DNS name copied: Web-server-LT-2123807376.us-east-1.elb.amazonaws.com (A Record)

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Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to [nginx.org](#).
Commercial support is available at [nginx.com](#).

Thank you for using nginx.

