

Project 1 - Deploying a Multi-Tier Website Using AWS EC2

Topic: Deploy a Multi-tier website using EC2

Description: Amazon Elastic Compute Cloud (Amazon EC2) provides scalable computing capacity in the Amazon Web Services (AWS) cloud. Using Amazon EC2 eliminates your need to invest in hardware up front, so you can develop and deploy applications faster. You can use Amazon EC2 to launch as many or as few virtual servers as you need, configure security and networking, and manage storage. Amazon EC2 enables you to scale up or down to handle changes in requirements or spikes in popularity, reducing your need to forecast traffic.

Problem Statement: Company ABC wants to move their product to AWS.

They have the following things setup right now:

1. MySQL DB

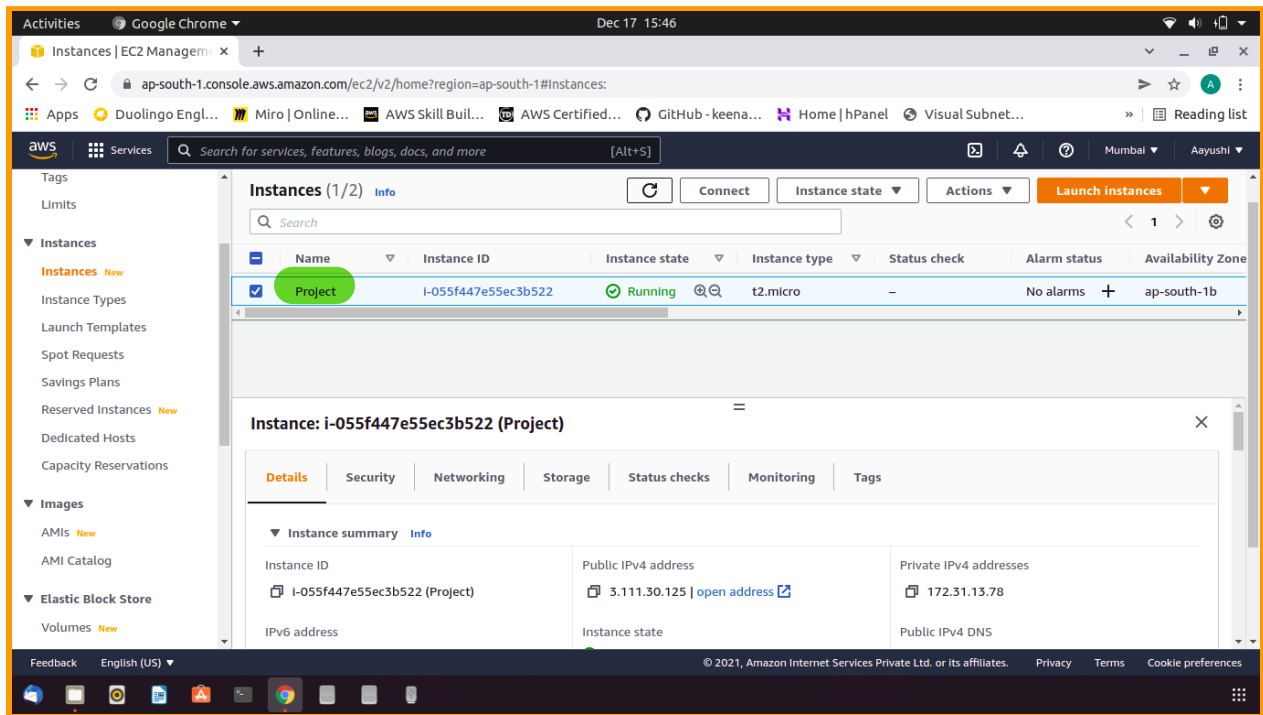
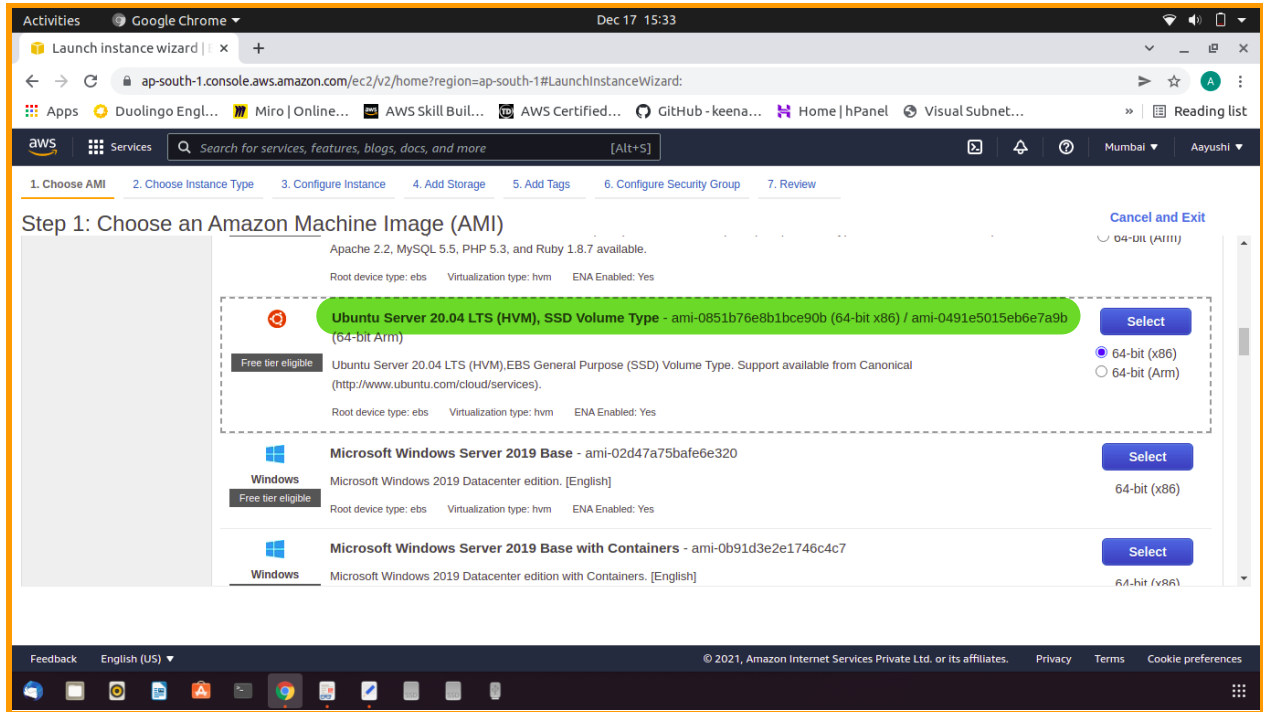
2. Website (PHP)

The company wants high availability on this product, therefore wants autoscaling to be enabled on this website.

Steps to solve:

1. Launch an EC2 Instance
2. Create an RDS Instance
3. Create Database & Table in RDS Instance
Database name: intel
Table name: data
Database password: intel123
4. Create classic load balancer
5. Enable Auto Scaling on these instances (minimum 2)
6. Allow traffic from EC2 to RDS Instance
7. Allow all-traffic to EC2 instance
8. Change hostname in website by using R53

Create instance take ubuntu machine



Take remote to the ubuntu machine

```

rio@rio:~/Downloads$
rio@rio:~/Downloads$ ls
Mumbaikey.pem
rio@rio:~/Downloads$ sudo su
[sudo] password for rio:
root@rio:/home/rio/Downloads# chmod 400 Mumbaikey.pem
root@rio:/home/rio/Downloads# ssh -i "Mumbaikey.pem" ubuntu@ec2-3-111-30-125.ap-
south-1.compute.amazonaws.com
The authenticity of host 'ec2-3-111-30-125.ap-south-1.compute.amazonaws.com (3.1
11.30.125)' can't be established.
ECDSA key fingerprint is SHA256:HL0MEt4LXJPHYPKrvCuWAvazvn6QeY5v0kCE0XuaK20.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-3-111-30-125.ap-south-1.compute.amazonaws.com,3.
111.30.125' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.11.0-1022-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Fri Dec 17 10:19:59 UTC 2021

System load:  0.01               Processes:           100
Usage of /:   18.4% of 7.69GB    Memory usage: 10%

```

First Update your system using the command

sudo apt-get update

```

ubuntu@ip-172-31-13-78:~$ sudo apt-get update
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates InRelease [1
14 kB]
Get:3 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]

```

Then use this command to install Apache2

sudo apt-get install apache2

```

ubuntu@ip-172-31-13-78:~$ sudo apt-get install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1 libaprutil1
  libaprutil1-dbd-sqlite3 libaprutil1-ldap libbanss04 liblua5.2-0 ssl-cert

```

Then install php-mysql using the following command

sudo add-apt-repository -y ppa:ondrej/php

sudo apt install php5.6 mysql-client php5.6-mysqli

Now everything is updated in your system

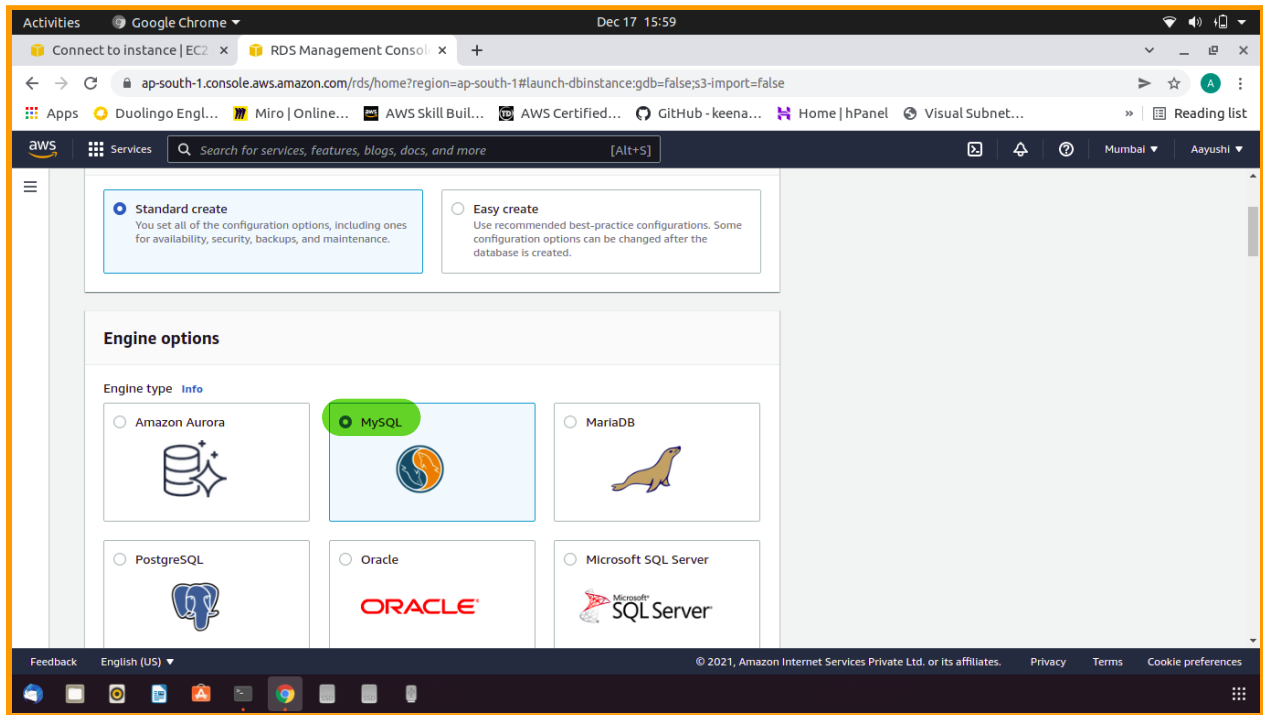
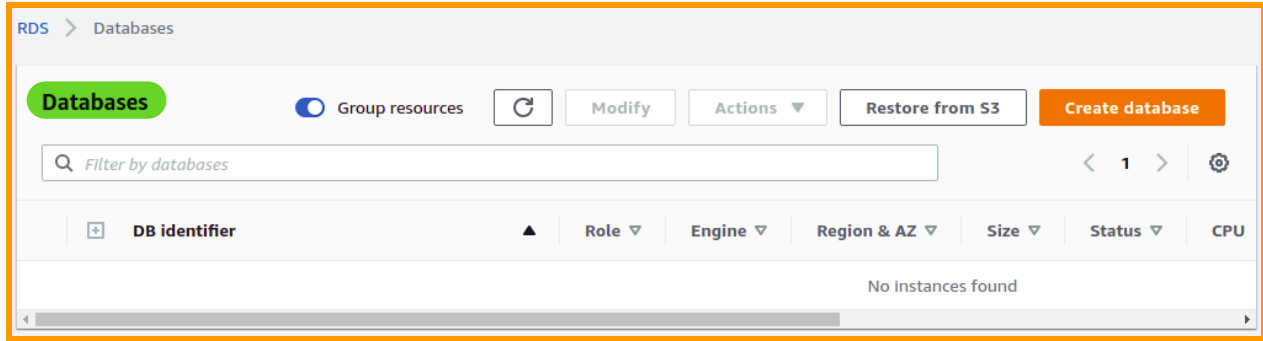
```
Processing triggers for libc-bin (2.31-0ubuntu9.2) ...
ubuntu@ip-172-31-13-78:~$ sudo add-apt-repository -y ppa:ondrej/php
Get:1 http://ppa.launchpad.net/ondrej/php/ubuntu focal InRelease [23.9 kB]
Hit:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal InRelease
Hit:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:4 http://security.ubuntu.com/ubuntu focal-security InRelease
Hit:5 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-backports InRelease
Get:6 http://ppa.launchpad.net/ondrej/php/ubuntu focal/main amd64 Packages [100.0 kB]
Get:7 http://ppa.launchpad.net/ondrej/php/ubuntu focal/main Translation-en [33.5 kB]
Fetched 157 kB in 2s (92.8 kB/s)
Reading package lists... Done
ubuntu@ip-172-31-13-78:~$ sudo apt install php5.6 mysql-client php5.6-mysqli
Reading package lists... Done
```

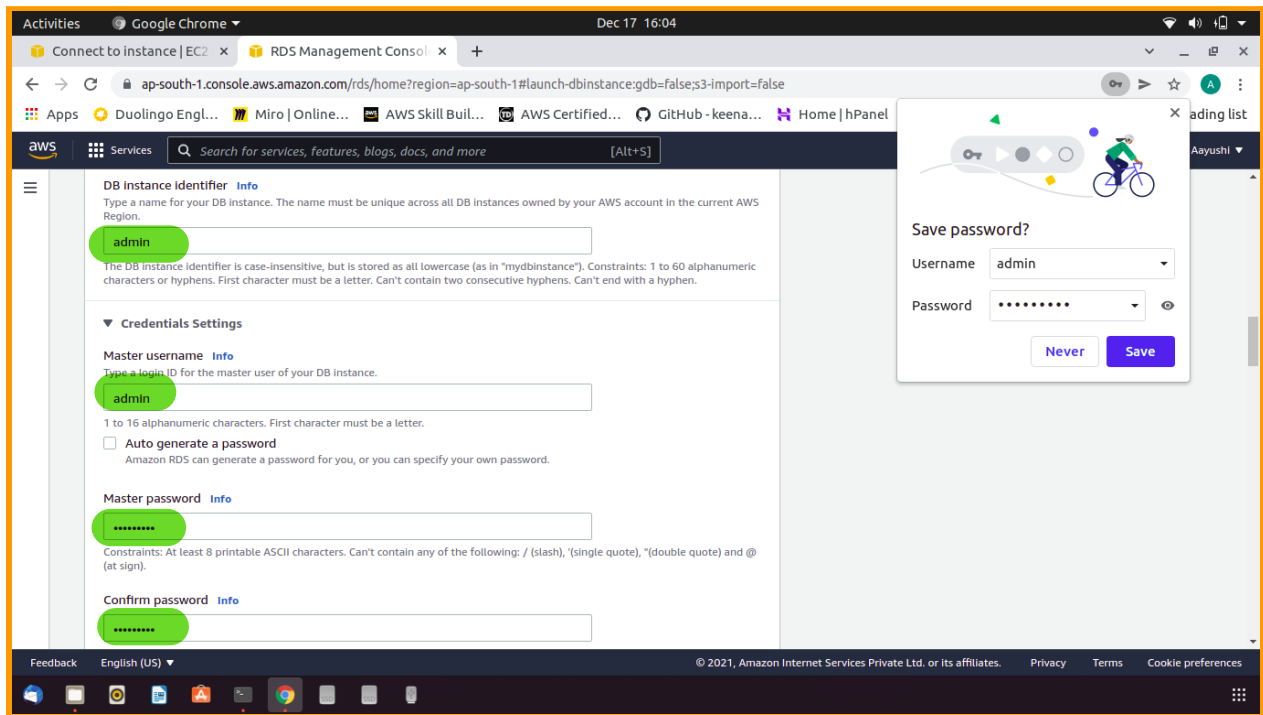
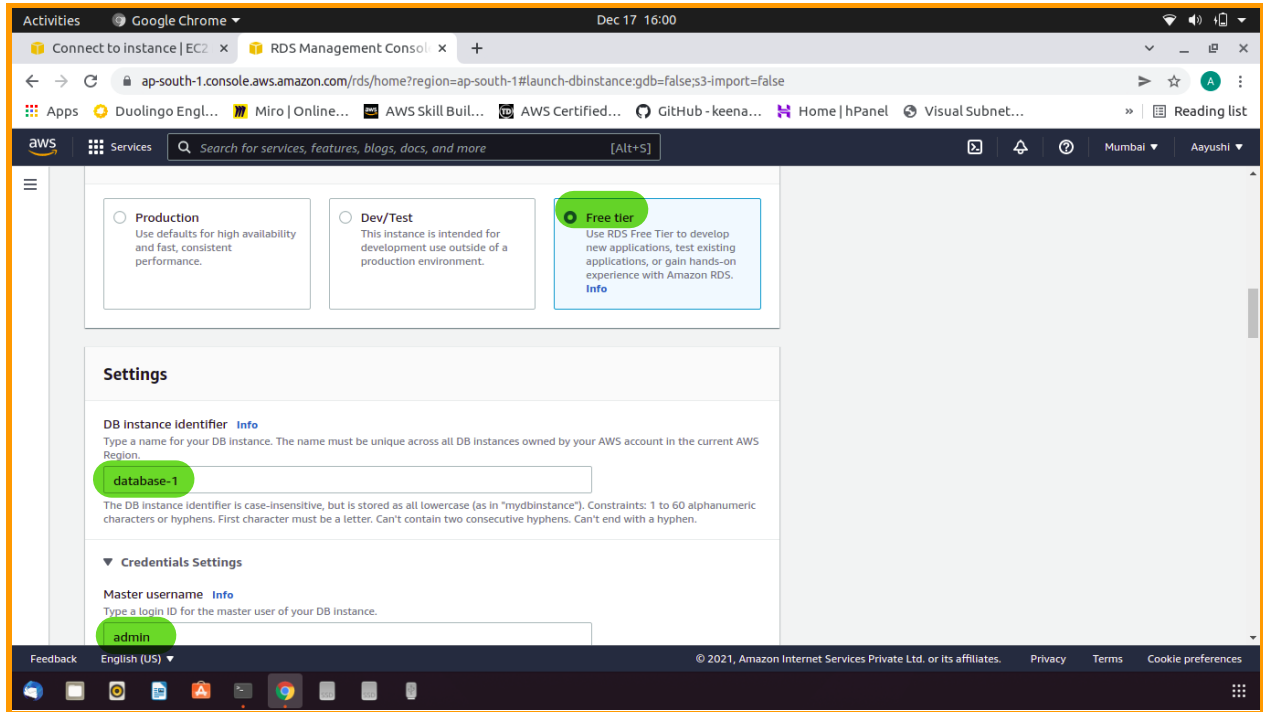
```
mode
update-alternatives: using /usr/bin/phar5.6 to provide /usr/bin/phar (phar) in a
uto mode
update-alternatives: using /usr/bin/phar.phar5.6 to provide /usr/bin/phar.phar (
phar.phar) in auto mode

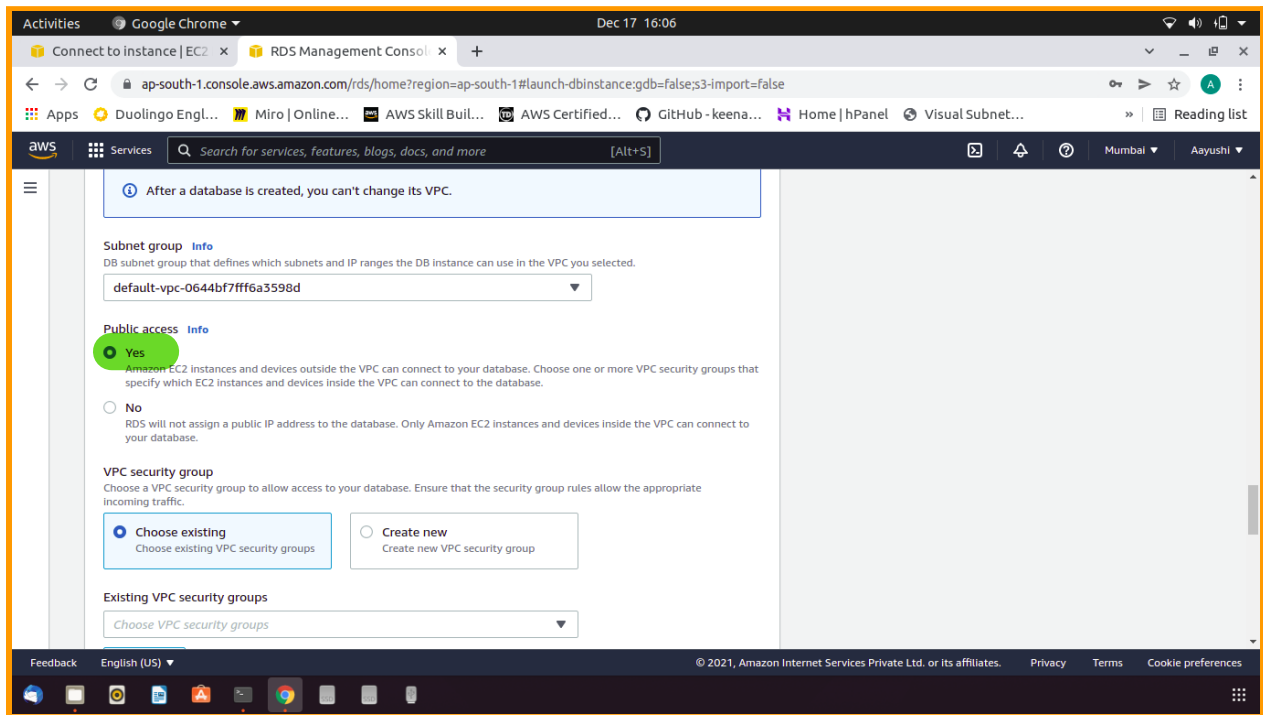
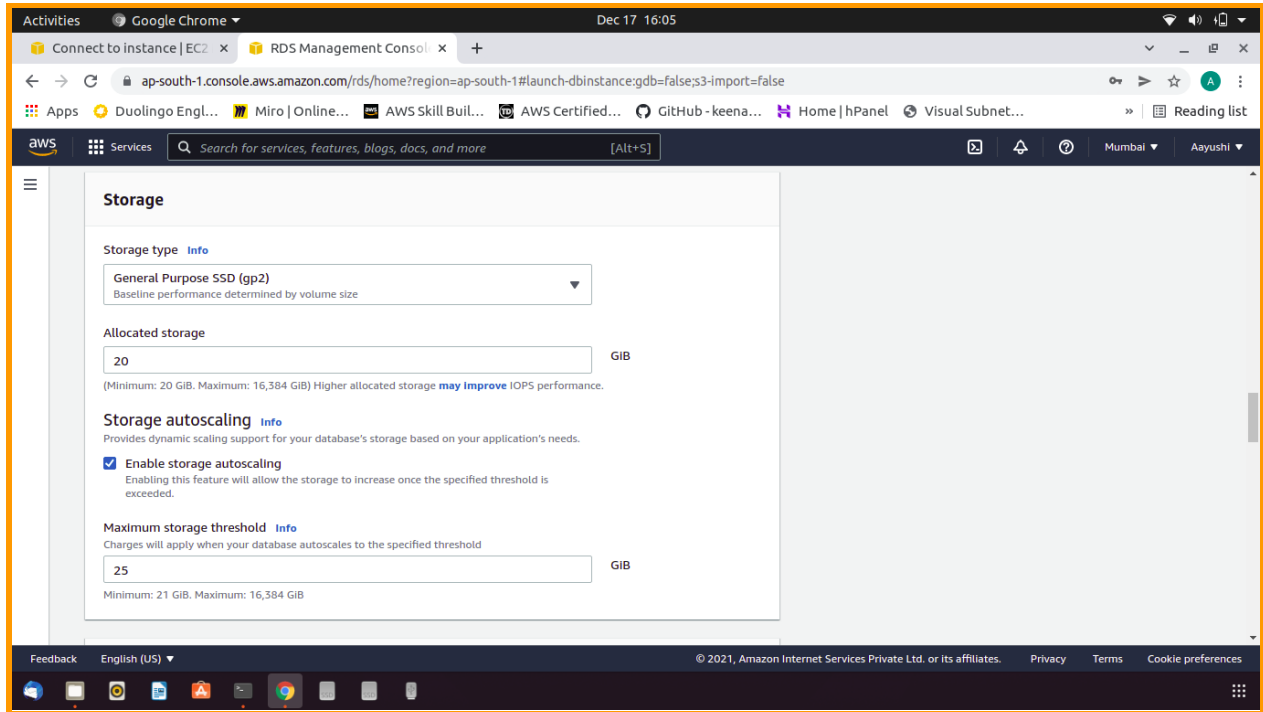
Creating config file /etc/php/5.6/cli/php.ini with new version
Setting up mysql-client (8.0.27-0ubuntu0.20.04.1) ...
Setting up libapache2-mod-php5.6 (5.6.40-57+ubuntu20.04.1+deb.sury.org+1) ...

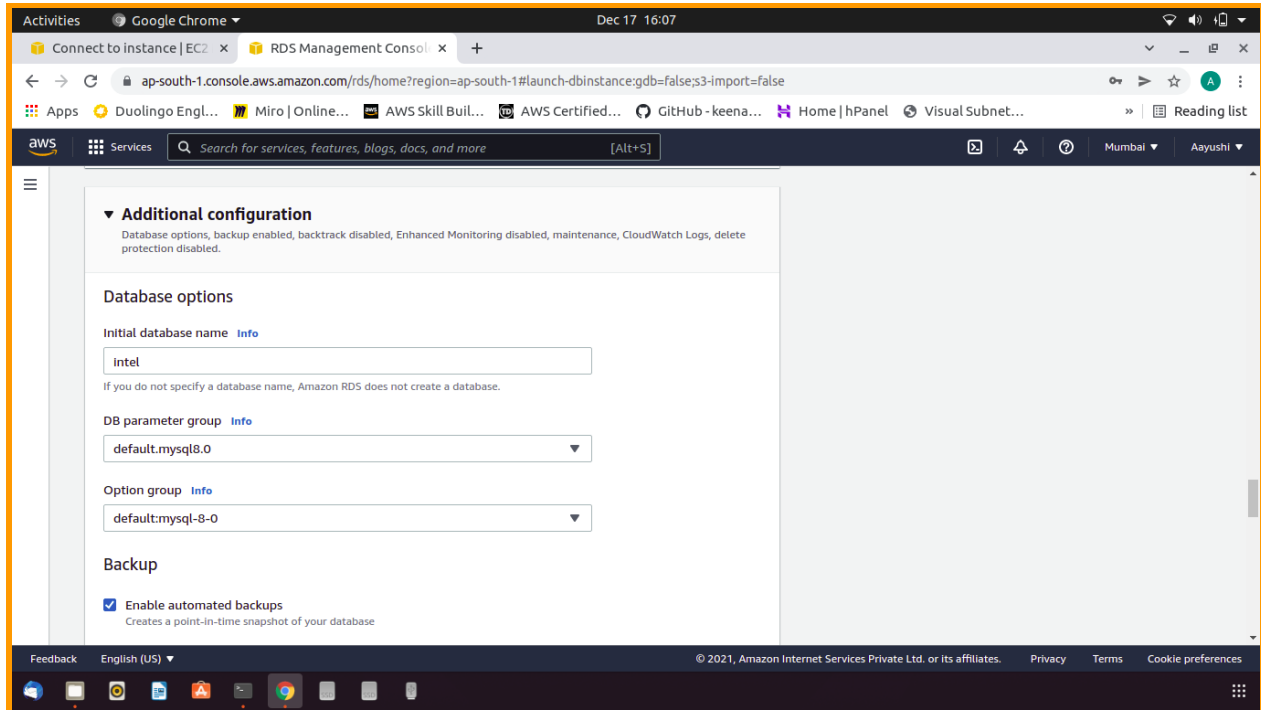
Creating config file /etc/php/5.6/apache2/php.ini with new version
Module mpm_event disabled.
Enabling module mpm_prefork.
apache2_switch_mpm Switch to prefork
apache2_invoke: Enable module php5.6
Setting up php5.6 (5.6.40-57+ubuntu20.04.1+deb.sury.org+1) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.2) ...
Processing triggers for php5.6-cli (5.6.40-57+ubuntu20.04.1+deb.sury.org+1) ...
Processing triggers for libapache2-mod-php5.6 (5.6.40-57+ubuntu20.04.1+deb.sury.
org+1) ...
ubuntu@ip-172-31-13-78:~$
ubuntu@ip-172-31-13-78:~$
```

Create DATABASE by using Mysql









Now install mysql by using command: **sudo apt install mysql-server**

```
rio@rio: ~  
rio@rio:~$ sudo apt install mysql-server  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
The following additional packages will be installed:  
  libaio1 libcgi-fast-perl libcgi-pm-perl libevent-core-2.1-7  
  libevent-pthreads-2.1-7 libfcgi-perl libhtml-template-perl libmecab2  
  mecab-ipadic mecab-ipadic-utf8 mecab-utils mysql-client-8.0  
  mysql-client-core-8.0 mysql-server-8.0 mysql-server-core-8.0  
Suggested packages:  
  libipc-sharedcache-perl mailx tinycat  
The following NEW packages will be installed:  
  libaio1 libcgi-fast-perl libcgi-pm-perl libevent-core-2.1-7  
  libevent-pthreads-2.1-7 libfcgi-perl libhtml-template-perl libmecab2  
  mecab-ipadic mecab-ipadic-utf8 mecab-utils mysql-client-8.0  
  mysql-client-core-8.0 mysql-server mysql-server-8.0 mysql-server-core-8.0  
0 upgraded, 16 newly installed, 0 to remove and 0 not upgraded.  
Need to get 31.5 MB of archives.  
After this operation, 262 MB of additional disk space will be used.  
Do you want to continue? [Y/n] y  
Get:1 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-client-  
core-8.0 amd64 8.0.27-0ubuntu0.20.04.1 [4,423 kB]  
Get:2 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-client-  
8.0 amd64 8.0.27-0ubuntu0.20.04.1 [22.0 kB]
```


mysql -h Hostname -u username -p

NOTE:

- o In place of hostname, make sure to use your Endpoint from RDS
- o Username which you created

```
rio@rio:~$ mysql -h intel.clypgq84znap.ap-south-1.rds.amazonaws.com -u intel -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 14
Server version: 8.0.23 Source distribution

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affiliates. Other names may be trademarks of their respective
owners.

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

mysql> SHOW DATABASES
```

To check the entry in database used following commands
to see database-----

show databases ;

to select database-----

use databasename ;

to see tables or data

select * from data ;

```
mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| intel      |
| mysql      |
| performance_schema |
| sys        |
+-----+
5 rows in set (0.04 sec)

mysql>
mysql>
mysql> use intel
Database changed
mysql>
```

Syntax of creating table

```
CREATE TABLE table_name
(
    column1 datatype,
    column2 datatype,
    ....
);
```

```
Create table intel.data
( firstname varchar(30) not null,
  Email varchar(30) not null
);
```

```
mysql> create table intel.data
-> ( firstname varchar(30) not null,
->   email      varchar(30) not null
-> );
Query OK, 0 rows affected (0.03 sec)

mysql>
```

```
mysql> use intel
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

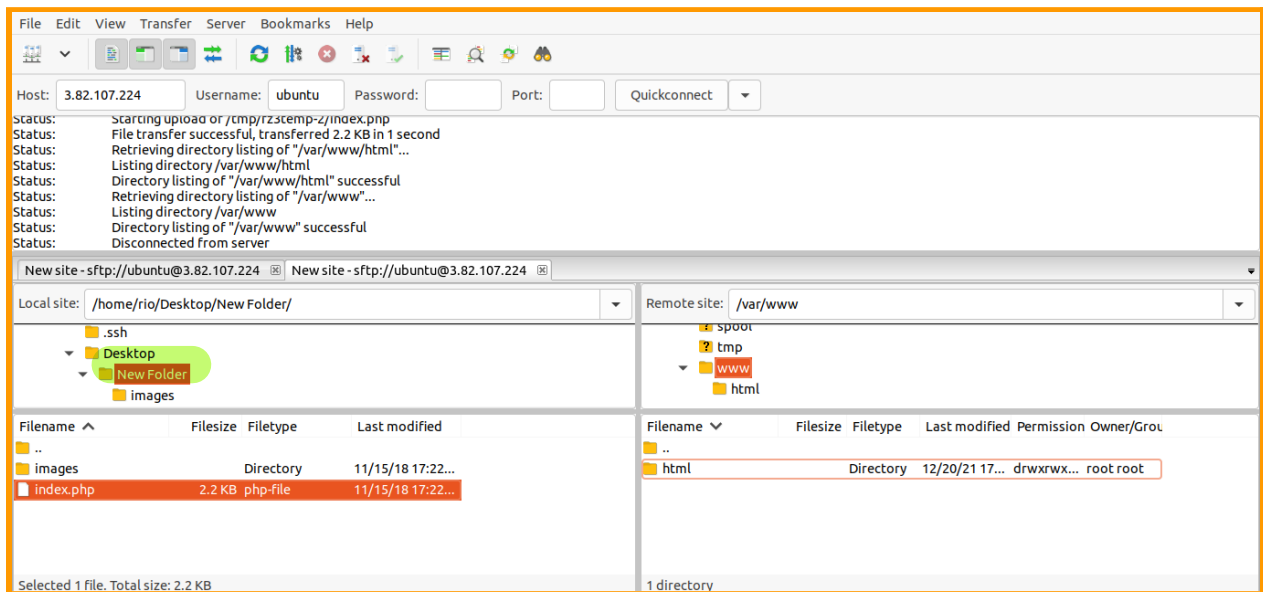
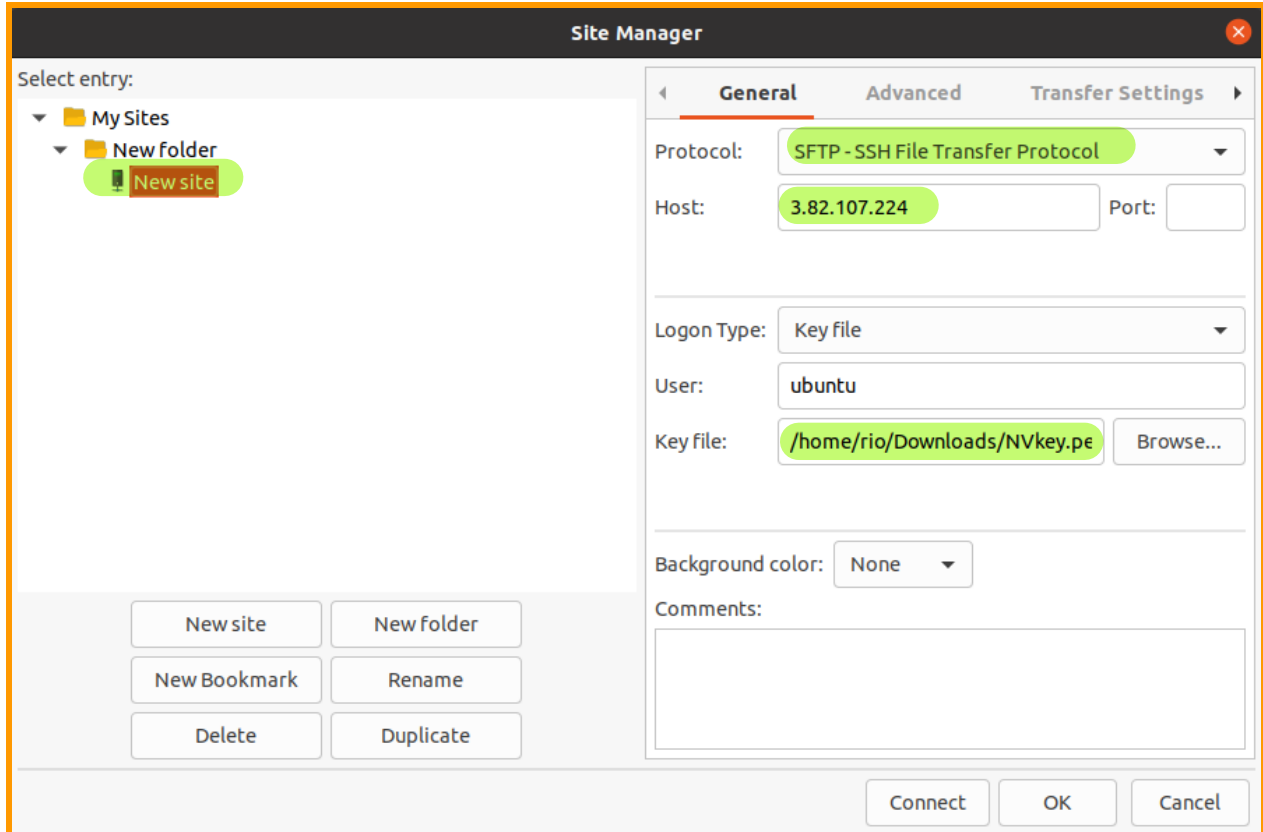
Database changed
mysql> select * from data ;
+-----+-----+
| firstname | email |
+-----+-----+
| aayushi   | ayushiverma630@gmail.com |
+-----+-----+
1 row in set (0.00 sec)

mysql> █
```

Install filezilla by using command : **sudo apt install filezilla**

```
rio@rio:~$ sudo apt install filezilla
[sudo] password for rio:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  filezilla-common libfilezilla0 libpugixml1v5 libwxbase3.0-0v5
  libwxgtk3.0-gtk3-0v5
The following NEW packages will be installed:
  filezilla filezilla-common libfilezilla0 libpugixml1v5 libwxbase3.0-0v5
  libwxgtk3.0-gtk3-0v5
0 upgraded, 6 newly installed, 0 to remove and 0 not upgraded.
Need to get 9,821 kB of archives.
After this operation, 40.6 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 filezilla-common
all 3.46.3-1build1 [2,267 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libfilezilla0 amd
64 0.19.3-1build1 [198 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libpugixml1v5 amd
64 1.10-1 [89.9 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libwxbase3.0-0v5
```

Make the connection





```
index.php
/tmp/fz3temp-2

23 pan="4"></td>
24
25
26
27
28
29 $_POST['firstname'];
30 $email['email'];
31 $e = "intel.cwywk9fxcofa.us-east-1.rds.amazonaws.com";
32 $ = "intel";
33 $ = "admin1234";
34 $el";
35 connection
36 $mysqli($servername, $username, $password, $db);
37
38 connection
39 >connect_error) {
40 connection failed: " . $conn->connect_error);
41
42 $_POST['firstname']) && isset($_POST['email']))){
43 INSERT INTO data (firstname,email)
44 .$firstname.", ' ".$email.'"");
45
46 >query($sql) === TRUE) {
47 New record created successfully";
48
49 Error: " . $sql . "<br>" . $conn->error;
50
51
52 ise();
53
54
55
56
```

PHP Tab Width: 8 Ln 31, Col 62 INS

Ping public ip

Name:

Email:

Submit

New record created successfully

Now create AMI through ubuntu machine

Amazon Machine Images (AMIs) (1) [Info](#) [Refresh](#) [EC2 Image Builder](#) [Actions](#) [Launch instance from image](#)

Owned by me [1](#) [Settings](#)

<input type="checkbox"/>	Name	AMI ID	AMI name	Source	Owner
<input type="checkbox"/>	-	ami-051e4c40e63a2a7fd	project	600904172815/project	60090417

Now create Classic Load Balancer

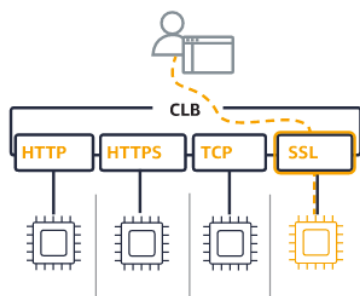
▼ Classic Load Balancer - *previous generation*

Classic Load Balancer [Info](#)

Choose a Classic Load Balancer when you have an existing application running in the EC2-Classical network.

[AWS will be retiring the EC2-Classical network on August 15, 2022. \[Learn more\]\(#\)](#)

[Create](#)



Make sure instance in CLB is inService

Volumes [New](#)
Snapshots [New](#)
Lifecycle Manager [New](#)

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

▼ Load Balancing
Load Balancers
Target Groups [New](#)

▼ Auto Scaling
Launch Configurations
Auto Scaling Groups

[Create Load Balancer](#) [Actions](#)

search: project [Add filter](#) [1 to 1 of 1](#) [>](#) [<](#)

<input checked="" type="checkbox"/>	Name	DNS name	State	VPC ID	Availability Zones	Type
<input checked="" type="checkbox"/>	project	project-1981035394.us-east-...	available	vpc-0e01f2f4d4d547512	us-east-1f, us-east-1e, ...	classic

Load balancer: **project**

[Description](#) [Instances](#) [Health check](#) [Listeners](#) [Monitoring](#) [Tags](#) [Migration](#)

Connection Draining: Enabled, 300 seconds ([Edit](#))


[Edit Instances](#)


Instance ID	Name	Availability Zone	Status	Actions
i-0720c719e52b42a26	project	us-east-1d	InService i	Remove from Load Balancer

[Edit Availability Zones](#)

Now launch configurations


EC2 > Launch configurations


Launch configurations (0) [Info](#)  [Actions](#) [Copy to launch template](#) [Create launch configuration](#)

< 1 > 

<input type="checkbox"/>	Name	AMI ID	Instance type	Spot price	Creation time
No launch configurations found in this region.					
Create launch configuration					

EC2 > Launch configurations

Launch configurations (1) [Info](#)  [Actions](#) [Copy to launch template](#) [Create launch configuration](#)

< 1 > 

<input type="checkbox"/>	Name	AMI ID	Instance type	Spot price	Creation time
<input type="checkbox"/>	Project	ami-051e4c40e6...	t2.micro	-	Fri Dec 17 2021 17:...

EC2 > Launch configurations > Create launch configuration

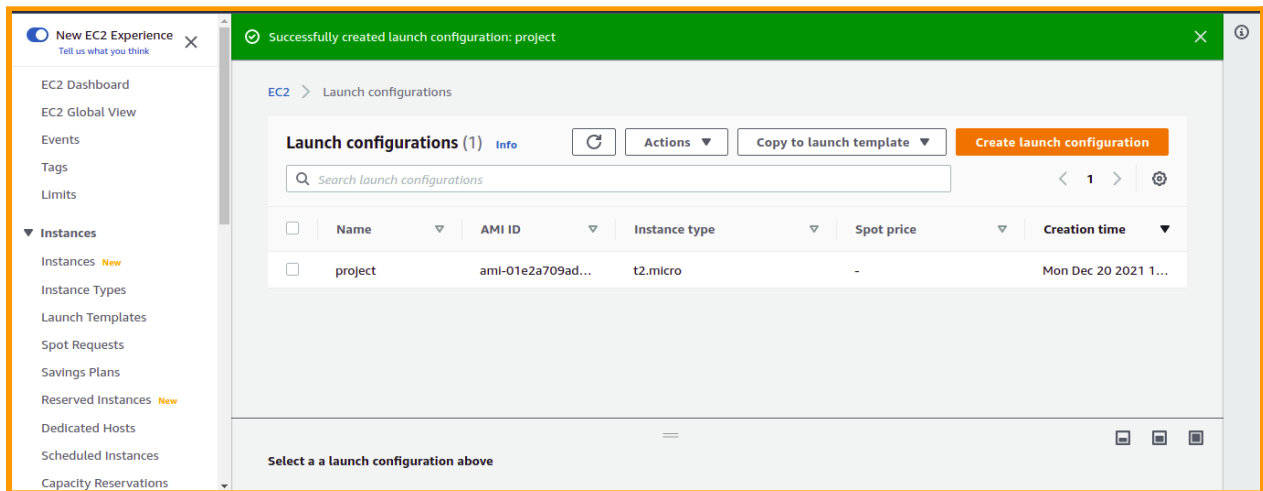
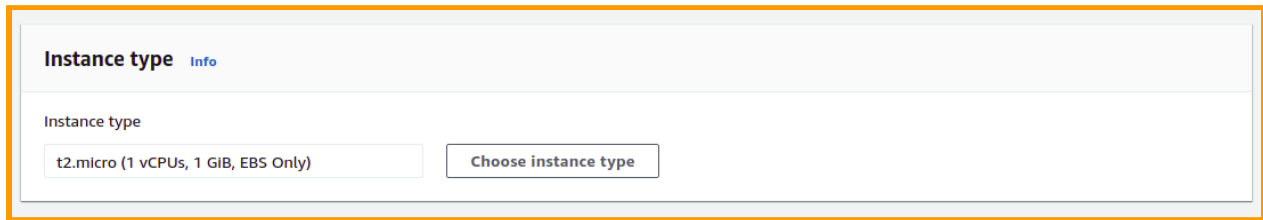
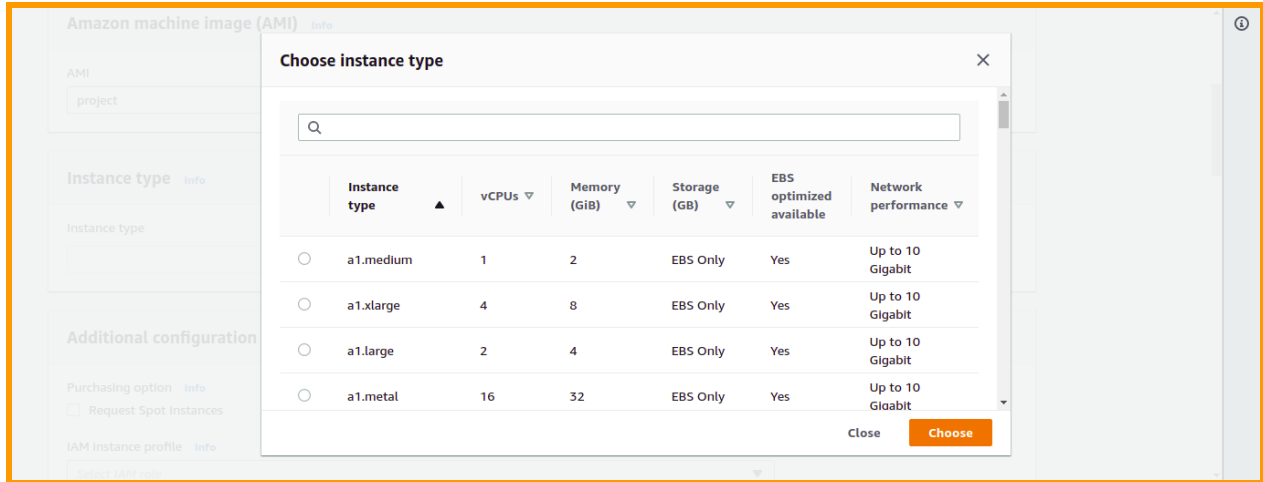
Create launch configuration [Info](#)

Launch configuration name

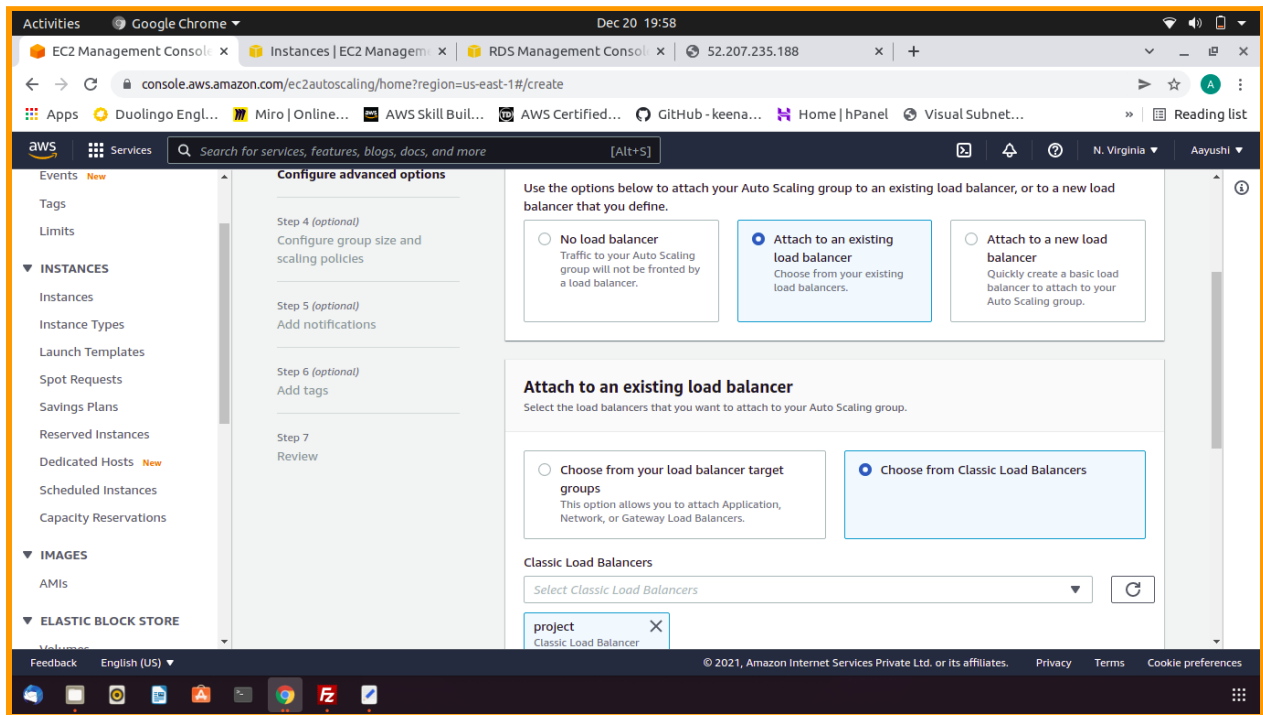
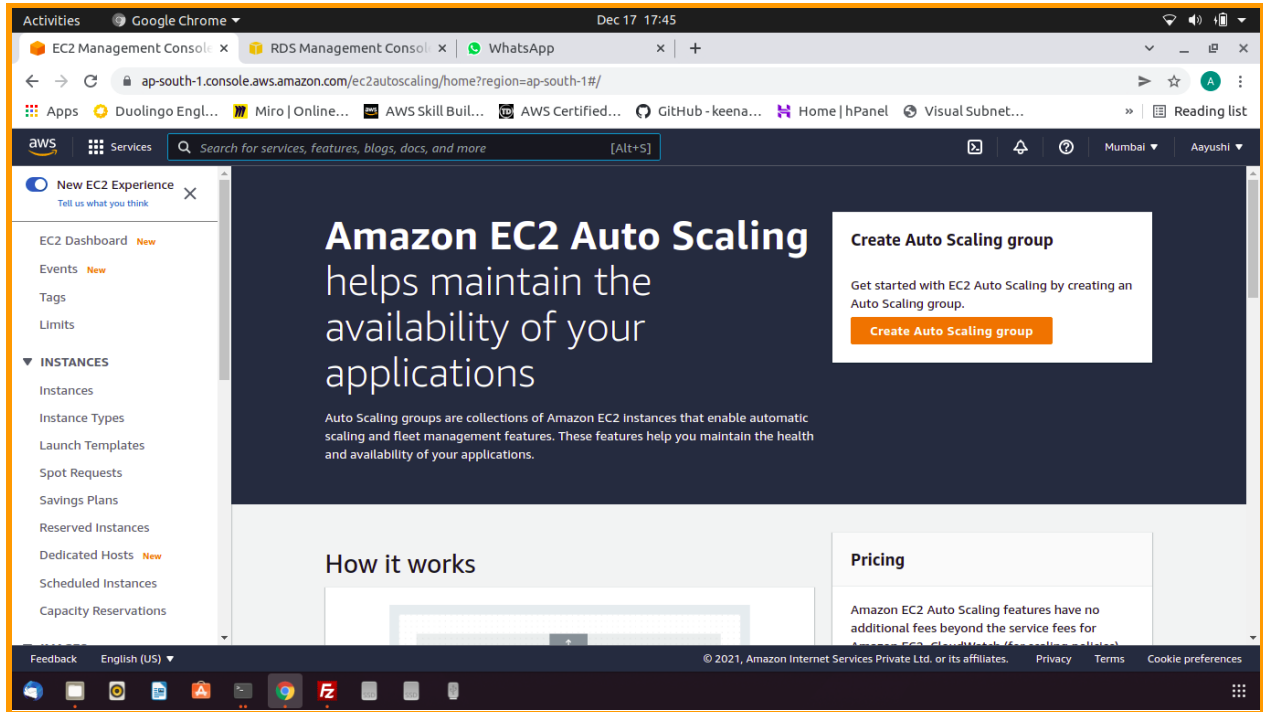
Name

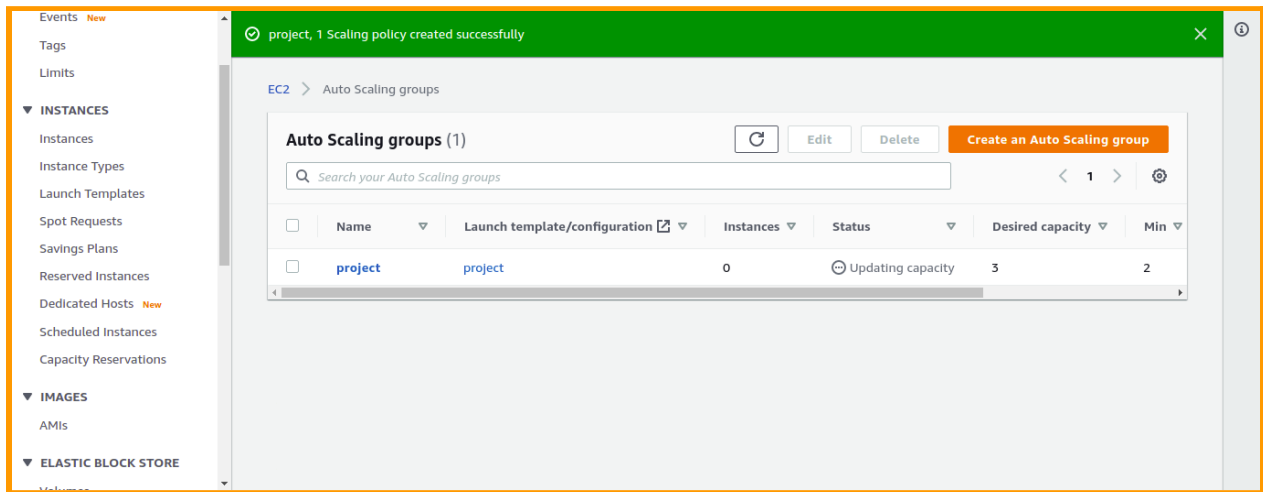
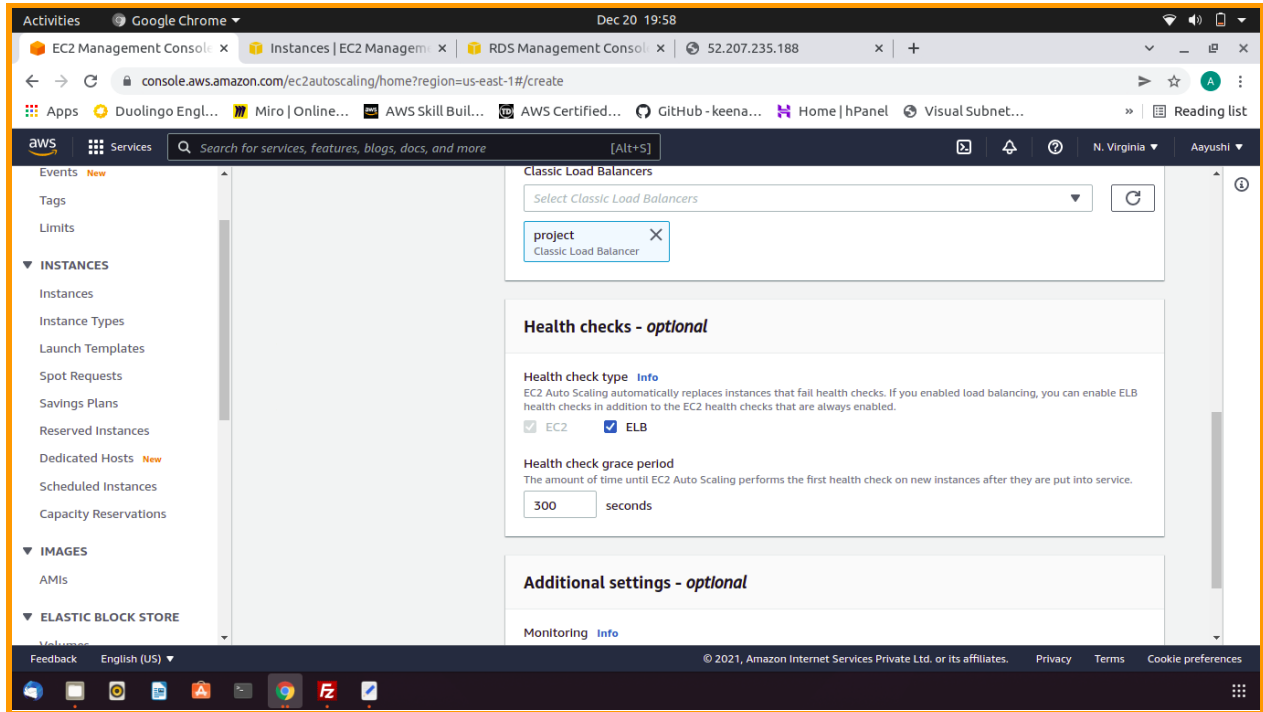
Amazon machine image (AMI) [Info](#)

AMI



Create Auto Scailing Group





Create Load Balancer

Actions

search : project

Add filter

1 to 1 of 1

Name	DNS name	State	VPC ID	Availability Zones	Type
project	project-1981035394.us-east-...		vpc-0e01f2f4d4d547512	us-east-1f, us-east-1e, ...	classic

Edit Instances

Instance ID	Name	Availability Zone	Status	Actions
i-0720c719e52b42a26	project	us-east-1d	InService ⓘ	Remove from Load Balancer
i-072b924cb40873d9e		us-east-1b	InService ⓘ	Remove from Load Balancer
i-0877d66437a521824		us-east-1a	InService ⓘ	Remove from Load Balancer
i-0654e454aa0dc0d41		us-east-1c	InService ⓘ	Remove from Load Balancer

Edit Availability Zones

Availability Zone	Subnet ID	Subnet CIDR	Instance Count	Healthy?	Actions
us-east-1f	subnet-	172.31.0.0/24	0	No (Availability Zone contains no	Remove from Load

Ping DNS of CLB

← → ↻ ⚠ Not secure | project-1981035394.us-east-1.elb.amazonaws.com

Apps

Duolingo Engl...

Miro | Online...

AWS Skill Buil...

AWS Certified...

GitHub - keena...

Home | hPanel

Visual Subnet...

»

Reading list

Name:

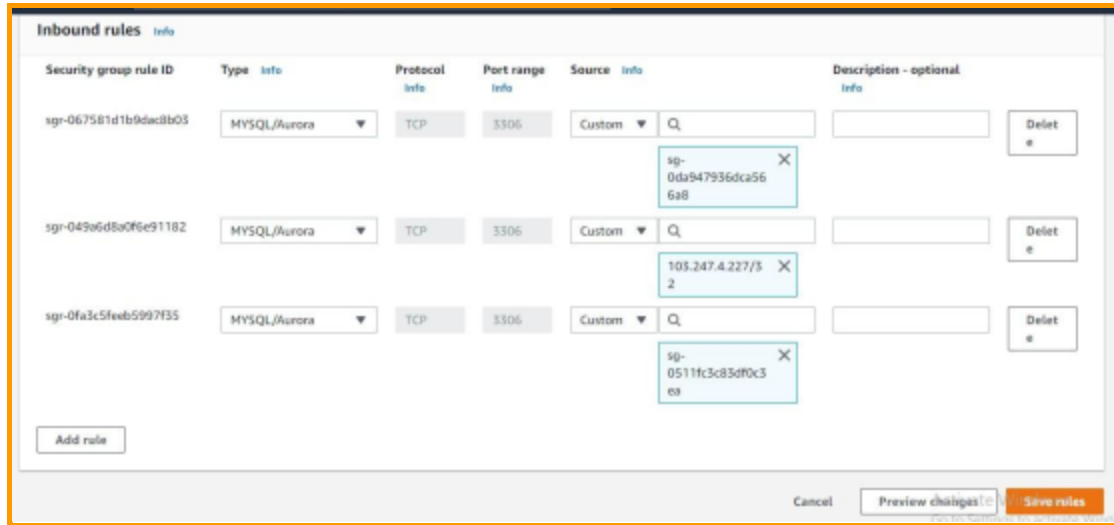
Email:

Submit

Configure the Security Groups

Allow traffic from EC2 to RDS Instance

Allow all-traffic to EC2 instance



Change hostname in website by using R53

Steps-

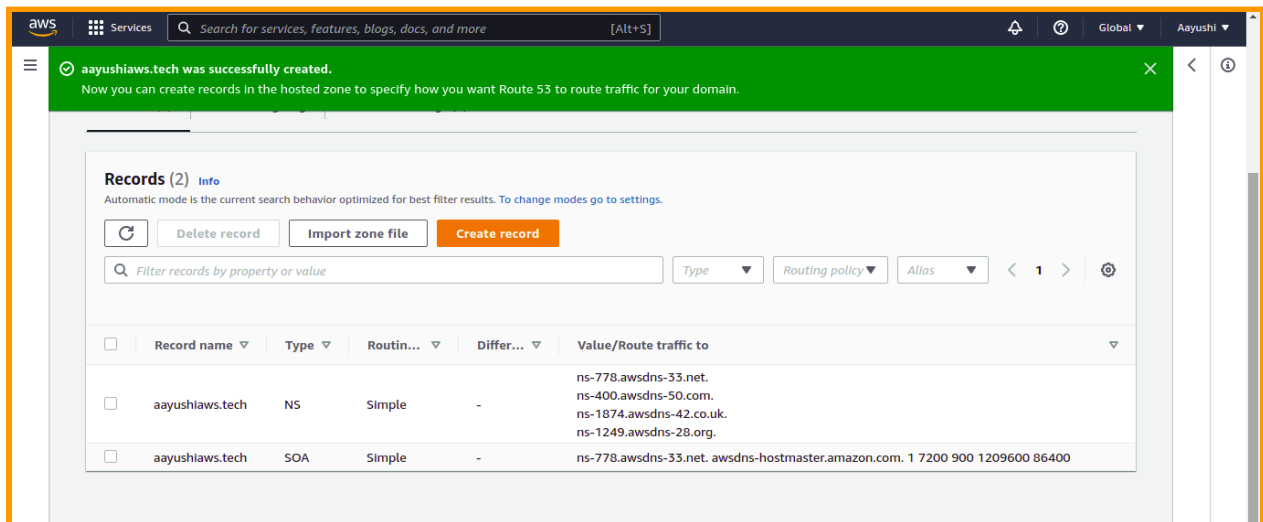
1-we need to purchase domain from r-53 or any of the third party domain providers in my case i have the domain from hostinger which is shashiaws.tech

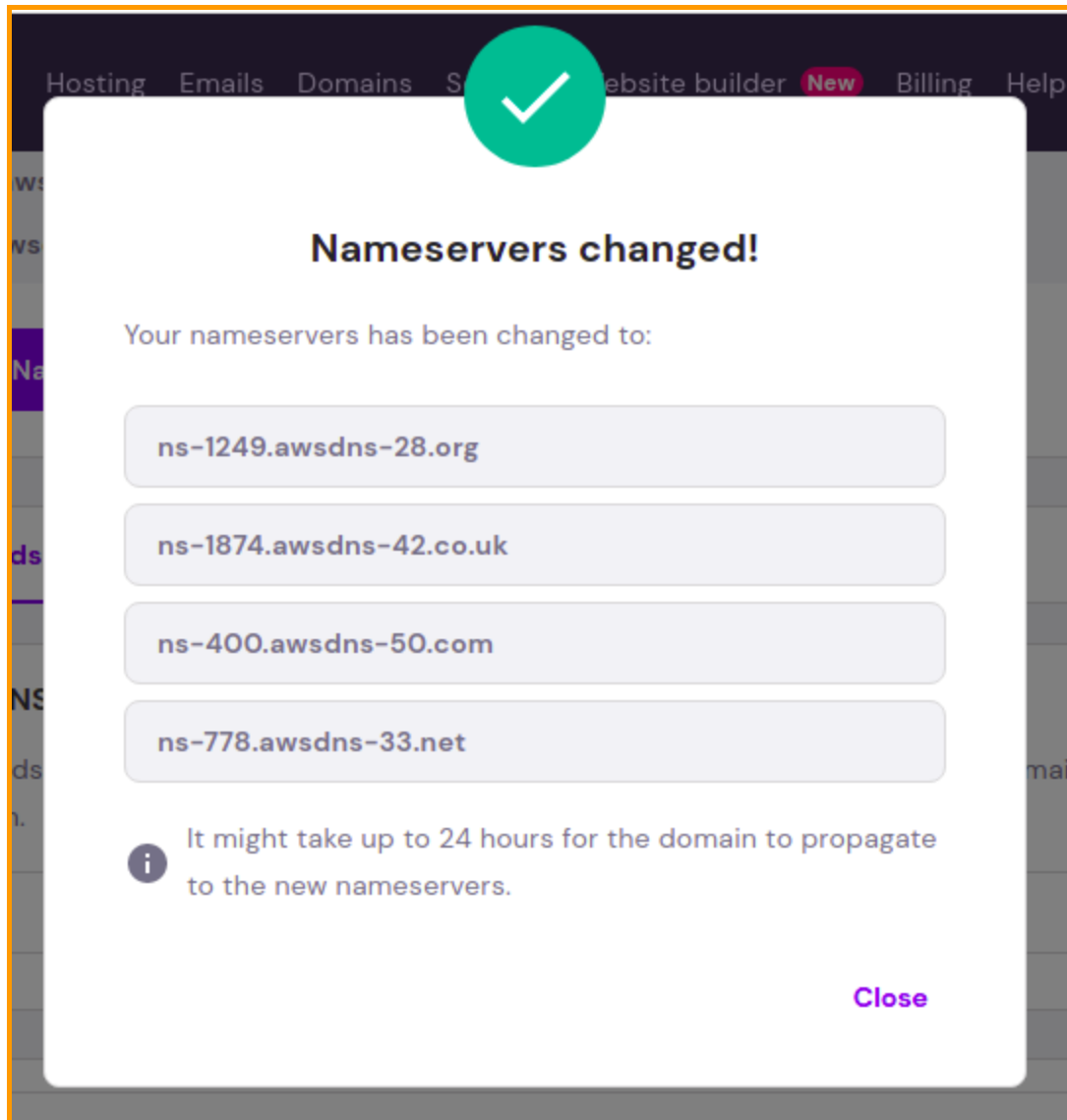
2-we need to create hosted zone

3-we need to create the record with routing policy

4-one it is done we need to copy and paste the name server to 3 party domain provider once it is done you can hit website with domain name

{www.aayushiaws.tech}





Create new record by using Alias

Quick create record [Info](#)

Switch to wizard

▼ Record 1

Record name [Info](#)

Valid characters: a-z, 0-9, ! " # \$ % & ' () * + , - / : ; < = > ? @ [\] ^ _ ` { | } . ~

Record type [Info](#)

A – Routes traffic to an IPv4 address and so...

Route traffic to [Info](#)

Alias ☒

Alias to Application and Classic Load Balancer

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

Routing policy [Info](#)

Simple routing

Evaluate target health

☒ Yes

Add another record

Cancel

Create records

Activities

Google Chrome

Dec 20 20:08

EC2 Managem...

Route 53 Cons...

Instances | EC...

RDS Managem...

52.207.235.188

project-19810...

DNS / Namese...

console.aws.amazon.com/route53/v2/hostedzones#ListRecordSets/Z01648822F9X6VIDDCSW5

Apps

Duolingo Engl...

Miro | Online...

AWS Skill Buil...

AWS Certified...

GitHub - keena...

Home | hPanel

Visual Subnet...

Reading list

aws

Services

Search for services, features, blogs, docs, and more

[Alt+5]

Record for aayushiaws.tech was successfully created.

Route 53 propagates your changes to all of the Route 53 authoritative DNS servers within 60 seconds. Use "View status" button to check propagation status.

View status

Records (1/3) [Info](#)

Automatic mode is the current search behavior optimized for best filter results. To change modes go to settings.

Refresh

Delete record

Import zone file

Create record

Filter records by property or value

Type

Routing policy

Alias

	Record name	Type	Routin...	Differ...	Value/Route traffic
<input checked="" type="checkbox"/>	aayushiaws.tech	A	Simple	-	dualstack.project-1981035394.us-east-1.elb.amazonaws.com
<input type="checkbox"/>	aayushiaws.tech	NS	Simple	-	ns-778.awsdns-33.net
<input type="checkbox"/>	aayushiaws.tech	SOA	Simple	-	ns-778.awsdns-33.net

Record details

Edit record

Record name

aayushiaws.tech

Record type

A

Value

dualstack.project-1981035394.us-east-1.elb.amazonaws.com

Alias

Yes

Feedback

English (US)

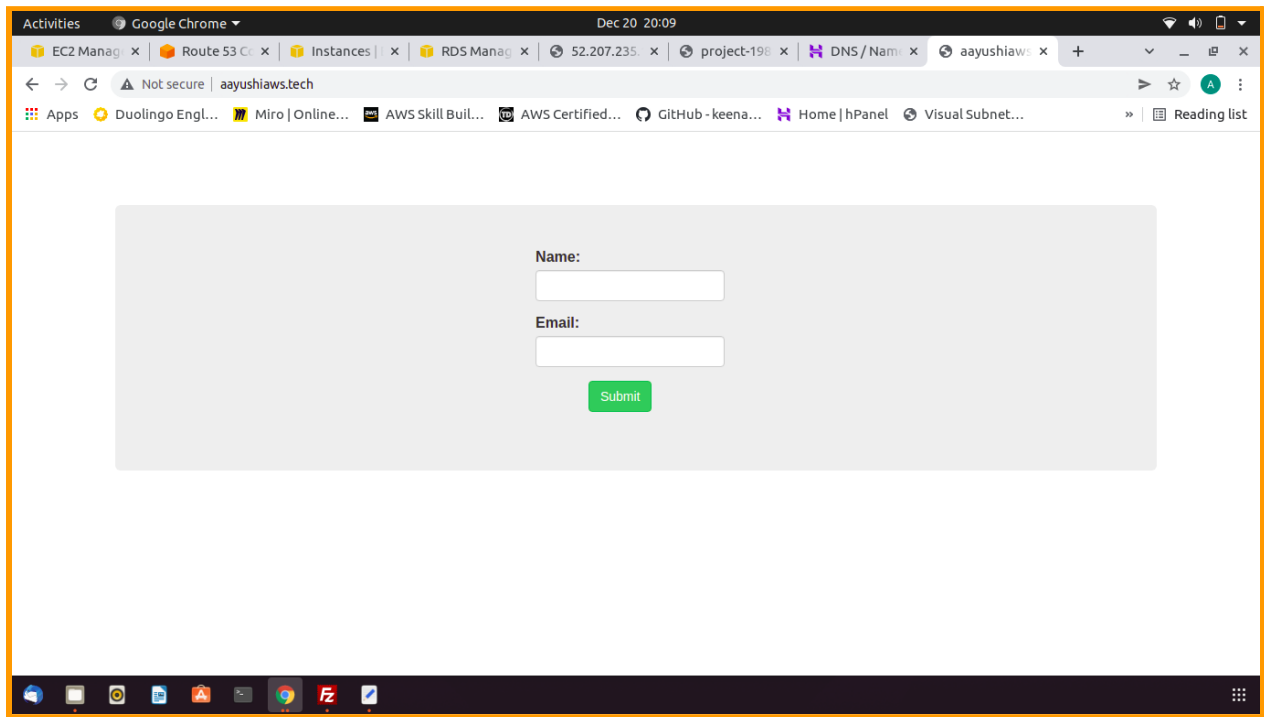
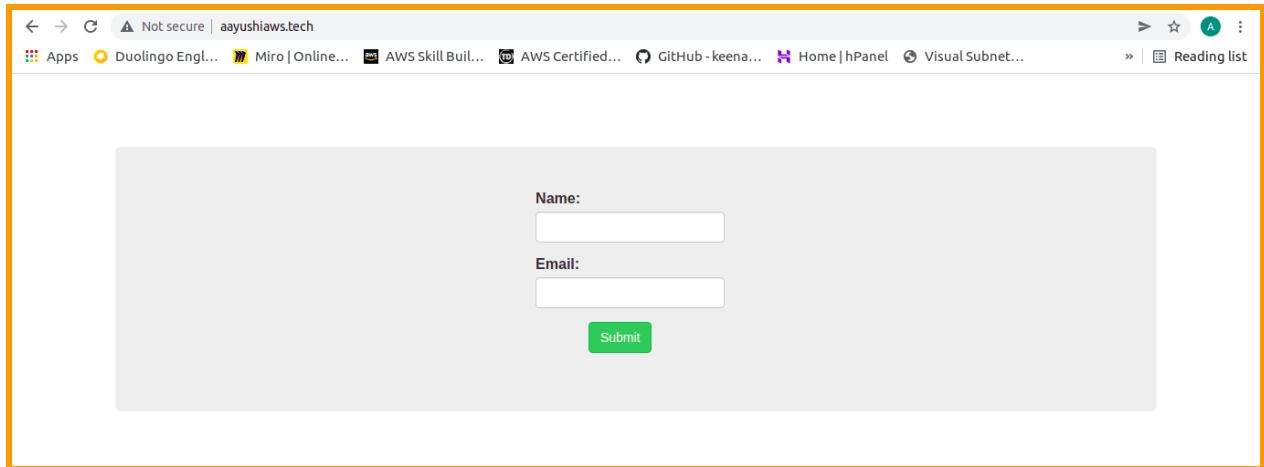
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Privacy

Terms

Cookie preferences

WE WILL HIT {www.aayushiaws.tech} IN THE BROWSER AND SEE THE RESULT



CHEERS FINALLY DONE