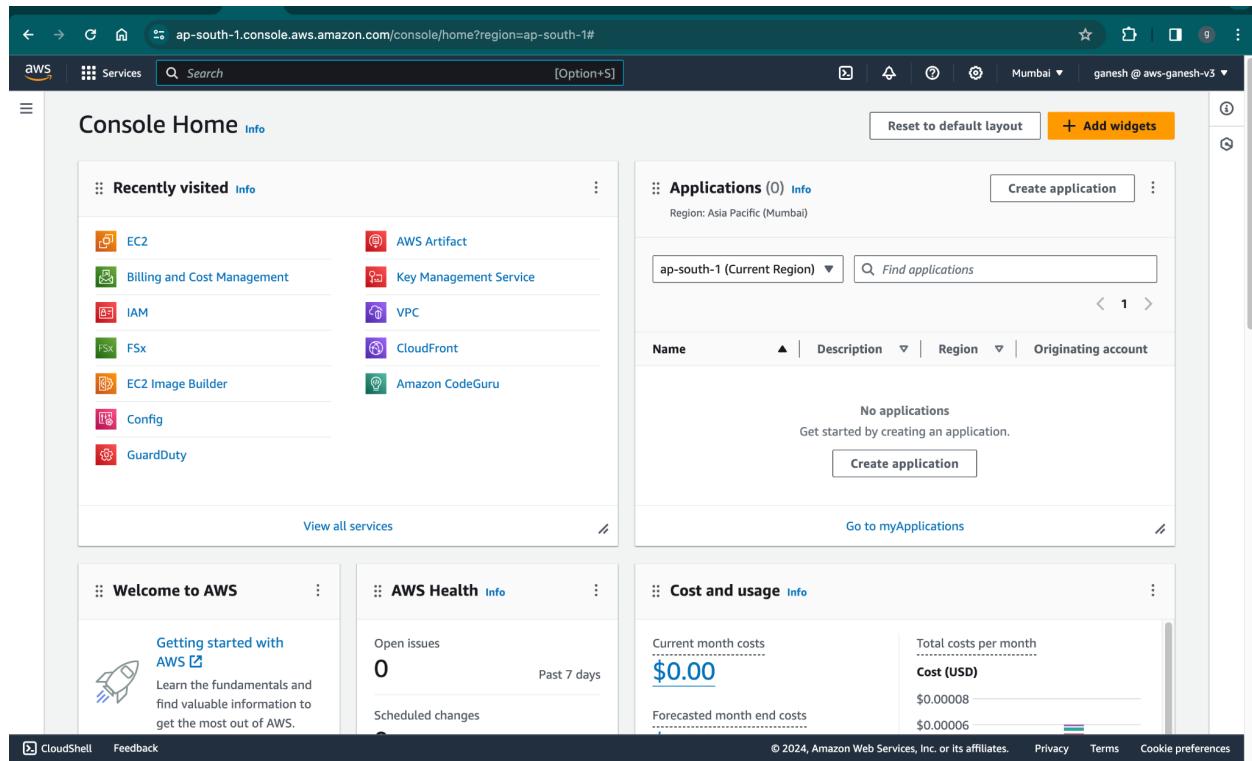


Steps to create EC2 instance and deploy Spring Boot Application

Create EC2 Instance through AWS Console

→ Login into AWS Console using IAM User credentials



The screenshot shows the AWS Console Home page. On the left, there's a sidebar with 'Recently visited' services: EC2, AWS Artifact, Billing and Cost Management, Key Management Service, IAM, VPC, FSx, CloudFront, EC2 Image Builder, Amazon CodeGuru, Config, and GuardDuty. Below this is a 'View all services' link. To the right, there are three main sections: 'Applications (0)', 'Cost and usage', and 'AWS Health'. The 'Applications' section shows a 'Create application' button and a note about no applications. The 'Cost and usage' section shows current month costs at \$0.00 and forecasted month end costs at \$0.00006. The 'AWS Health' section shows 0 open issues over the past 7 days.

→ Navigate to EC2 Dashboard either by clicking EC2 in recently visited or through search or Services Menu(Services -> Compute -> EC2)

The screenshot shows the AWS EC2 Dashboard. On the left, there's a sidebar with navigation links for EC2 Dashboard, Instances, Images, Elastic Block Store, Network & Security, and CloudShell. The main area has a "Resources" section with a table showing counts for various EC2 components. To the right, there's a "EC2 Free Tier" section with information about offers and usage, and a "Offer usage (monthly)" section showing Linux EC2 Instances and Storage space on EBS.

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

→ To create EC2 Instance got the Instances view and click on Launch Instance

The screenshot shows the AWS EC2 Instances view. The sidebar includes links for EC2 Dashboard, Instances (selected), Images, and CloudShell. The main area displays a table of instances with one entry: "My first instance" (Instance ID: i-01e00795879e09f61, State: Terminated, Type: t2.micro). Below the table is a modal window titled "Select an instance" which is currently empty.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zon
My first instance	i-01e00795879e09f61	Terminated	t2.micro	-	No alarms	ap-south-1b

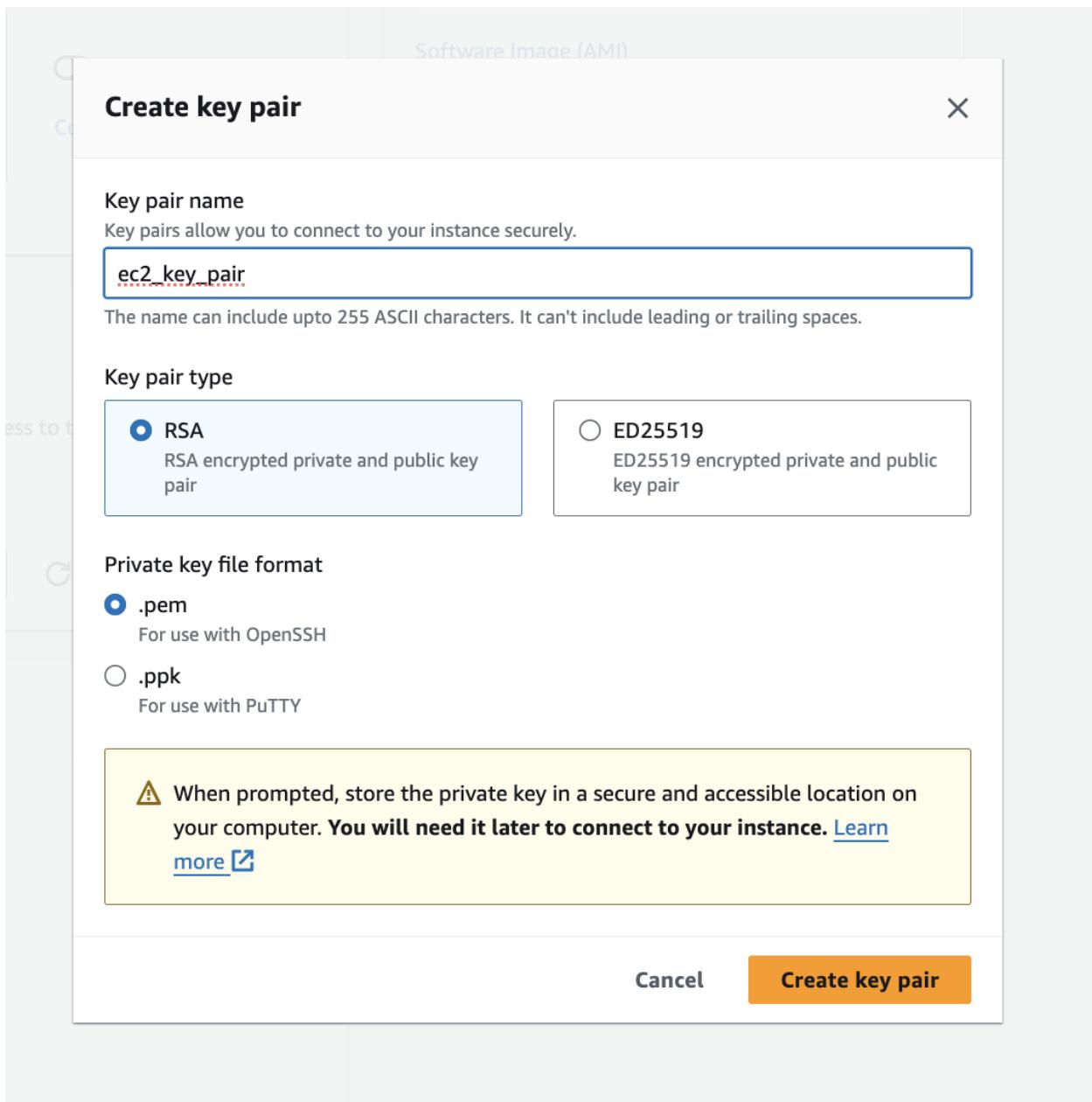
→ Provide the name of the EC2 Instance and select the AMI (linux/windows/mac ...)

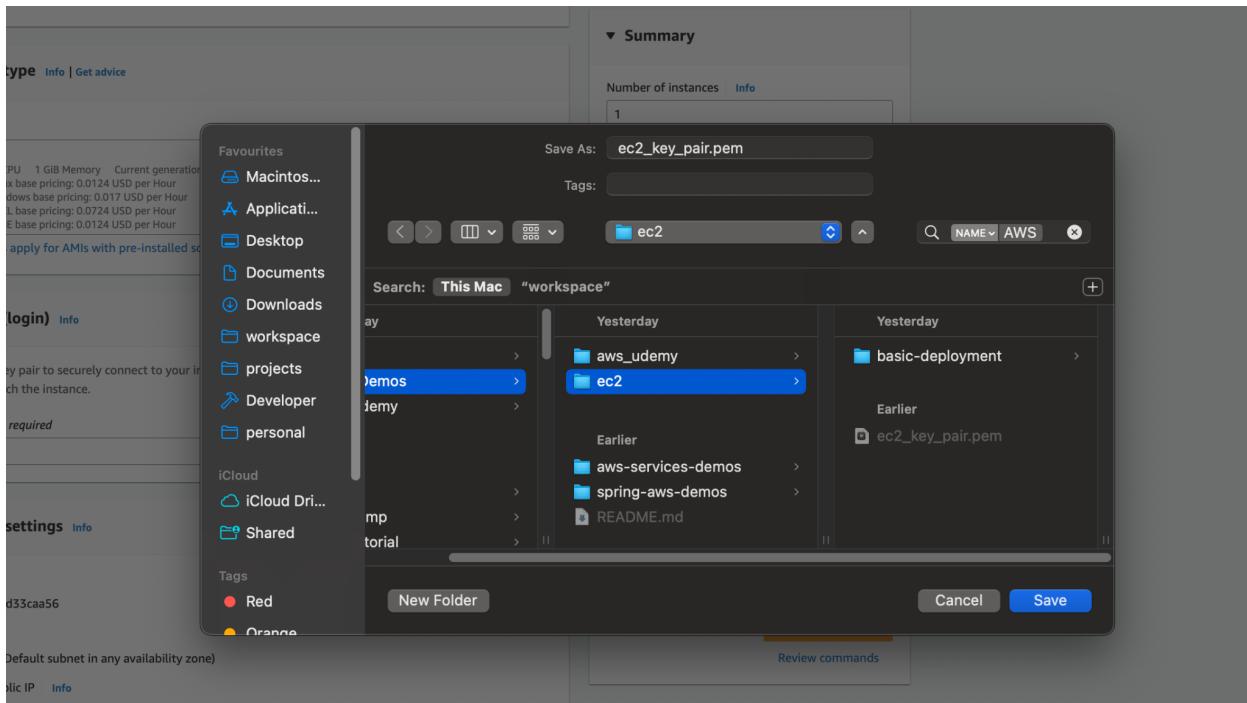
The screenshot shows the AWS EC2 'Launch an instance' wizard. In the 'Name and tags' section, the instance is named 'My First EC2 Instance'. Under 'Application and OS Images (Amazon Machine Image)', the 'Amazon Linux 2023 AMI' is selected. The 'Free tier eligible' checkbox is checked. In the 'Summary' panel, it shows 1 instance being launched. The 'Launch instance' button is prominently displayed.

→ Select the Instance type and create Key Pair which will be used to connect to ec2 instance from terminal using SSH

The screenshot shows the AWS EC2 'Launch instances' wizard. In the 'Instance type' section, the 't2.micro' instance type is selected. In the 'Key pair (login)' section, a new key pair is being created. The 'Network settings' section shows a subnet and auto-assign public IP enabled. A note at the bottom indicates a new security group will be created. The 'Summary' panel shows 1 instance being launched, and the 'Launch instance' button is present.

→ Create a new key pair by clicking on Create new key pair(link) and download the pem file which will be needed to connect to EC2 Instance using SSH





The screenshot shows the AWS CloudFormation console with a stack named 'basic-deployment'. The 'Launch instance' button is highlighted in orange. The 'Summary' section shows 1 instance. Other sections include 'Software Image (AMI)', 'Virtual server type (instance type)', 'Firewall (security group)', and 'Storage (volumes)'. A tooltip for the 'Free tier' is visible, stating: '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 I/Os, 1 GB of snapshots, and 100 GB of bandwidth to the internet.'

-> check on HTTP option in Network Settings which will add an inbound rule in Security Group so setup an endpoint

The screenshot shows the AWS EC2 Launch Instances wizard. On the left, under 'Network settings', it shows a VPC (vpc-093a362e5d33ca56) and a subnet (No preference). It includes options for auto-assigning public IP and creating a new security group ('Create security group'). A note says: 'We'll create a new security group called "launch-wizard-1" with the following rules:'. Under 'Allow SSH traffic from' and 'Allow HTTP traffic from the internet', the 'Anywhere' option is selected. A warning message states: '⚠ Rules of source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.' On the right, the 'Summary' section shows 1 instance, AMI (Amazon Linux 2023 AMI 2023.3.2...), instance type (t2.micro), and storage (1 volume(s) - 8 GiB). A tooltip for the 'Free tier' indicates: '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 I/Os, 1 GiB of snapshots, and 100 GiB of bandwidth to the internet.' At the bottom, there are 'Launch instance' and 'Review commands' buttons.

→ If you want to execute any commands on ec2 instance startup then you can place that in User Data which is under Advance Details

The screenshot shows the AWS EC2 Launch Instances wizard with 'Advanced' details selected. It includes sections for Metadata accessible (Enabled), Metadata transport (Select), Metadata version (V2 only (token required)), and Metadata response hop limit (2). A note says: '⚠ For V2 requests, you must include a session token in all instance metadata requests. Applications or agents that use V1 for instance metadata access will break.' Under 'User data - optional', it says: 'Upload a file with your user data or enter it in the field.' A file input field is shown with the placeholder 'Choose file'. A note at the bottom says: '□ User data has already been base64 encoded'. On the right, the 'Summary' section shows 4 instances, AMI (Amazon Linux 2023 AMI 2023.3.2...), instance type (t2.micro), and storage (1 volume(s) - 8 GiB). A tooltip for the 'Free tier' is identical to the one in the previous screenshot. At the bottom, there are 'Launch instance' and 'Review commands' buttons.

(Ignore the other options in Advance Details for this demo)

→ Click on Launch to create and start the ec2 instance

The screenshot shows the AWS CloudWatch Metrics interface with multiple metrics listed on the left side. In the center, there is a detailed view of the 'CloudWatch Metrics' metric, including its ARN, dimensions, and a large preview pane showing historical data points.

CloudWatch Metrics

- arn:aws:cloudwatchmetrics:metric:CloudWatchMetrics
- dimensions: {MetricName: CloudWatch Metrics}
- last updated: 1 hour ago
- approximate data points (100 total):

Time	Value
2024-01-15T12:00:00Z	100
2024-01-15T12:05:00Z	100
2024-01-15T12:10:00Z	100
2024-01-15T12:15:00Z	100
2024-01-15T12:20:00Z	100
2024-01-15T12:25:00Z	100
2024-01-15T12:30:00Z	100
2024-01-15T12:35:00Z	100
2024-01-15T12:40:00Z	100
2024-01-15T12:45:00Z	100
2024-01-15T12:50:00Z	100
2024-01-15T12:55:00Z	100
2024-01-15T13:00:00Z	100
2024-01-15T13:05:00Z	100
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2024-01-15T33:45:00Z	100
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2024-01-15T35:45:00Z	100
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2024-01-15T36:30:00Z	100
2024-01-15T36:35:00Z	100
2024-01-15T36:40:00Z	100
2024-01-15T36:45:00Z	100
2024-01-15T36:50:00Z	100
2024-01-15T36:55:00Z	100

The screenshot shows the AWS EC2 Instances page. On the left, there's a sidebar with various navigation options like EC2 Dashboard, Instances, Images, and Network & Security. The main area displays a table of instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 IP	Elastic IP
My first instance	i-01e00795879e09f61	Terminated	t2.micro	-	No alarms	ap-south-1b	-	-	-
My First EC2 Instance	i-01660fb291ce2c250	Running	t2.micro	Initializing	No alarms	ap-south-1b	ec2-3-111-42-37.ap-so...	3.111.42.37	-

Below the table, a modal window titled "Select an instance" is open, showing the same two instances.

-> Click on the instance to see the details

The screenshot shows the AWS EC2 Instance Details page for the instance i-0557e729210eb5bc. The left sidebar has the same navigation as the previous screen. The main content area is divided into sections:

- Instance summary**: Shows the instance ID (i-0557e729210eb5bc), state (Running), and private IP (13.201.45.56).
- Details**: A tabbed section showing various configuration details:
 - General**: Platform (Amazon Linux (Inferred)), AMI ID (ami-0a0f1259d1c90938), AMI name (al2023-ami-2023.3.20231218.0-kernel-6.1-x86_64), Launch time (Sat Jan 06 2024 07:16:51 GMT+0530 (India Standard Time)), and Kernel ID (-).
 - Networking**: Subnet ID (subnet-0b58bd000e94317ac), VPC ID (vpc-093a362e5d53caa56), and Private IP (13.201.45.56 [Public IP]).
 - Monitoring**: Monitoring disabled.
 - Security**: Termination protection Disabled.
 - Networking**: Elastic IP addresses (172.31.46.128), Public IPv4 DNS (ec2-13-201-45-56.ap-south-1.compute.amazonaws.com), and Auto Scaling Group name (-).
- Instance details**: A tabbed section showing instance auto-recovery (Default), AMI Launch index (0), Credit specification (standard), Lifecycle (normal), Key pair assigned at launch (ec2_key_pair), and State transition reason (-).

→ We can see the public IP and private IP under details in the details tab. And Inbound and Outbound rules under Security Tab.

The screenshot shows the AWS EC2 Instances details page for an instance named 'My First EC2 Instance' (ID: i-0557e729210eb5bc). The 'Security' tab is selected, displaying the following information:

- Security details:** IAM Role: -; Owner ID: 479581134780; Launch time: Sat Jan 06 2024 07:16:51 GMT+0530 (India Standard Time).
- Inbound rules:** A table showing one rule:

Name	Security group rule ID	Port range	Protocol	Source	Security groups	Description
-	sgr-085eed60eeb0ae76a	22	TCP	0.0.0.0/0	launch-wizard-1	-
- Outbound rules:** A table showing one rule:

Name	Security group rule ID	Port range	Protocol	Destination	Security groups	Description
-	sgr-0b1de541ea6b13ca0	All	All	0.0.0.0/0	launch-wizard-1	-

-> We can see the Networking , Storage (EBS volume) and other details under respective tabs (ignoring for this demo)

-> Now take the public IP which is required to connect to EC2 Instance from terminal
public IP : 13.201.45.56

Connect EC2 Instance using SSH

→ Open the terminal and navigate to the folder where we placed the pem file.

```
→ AWS_Demos git:(master) pwd  
/Users/gundamaiahannamaina/workspace/AWS_Demos  
→ AWS_Demos git:(master) cd ec2  
→ ec2 git:(master) ls  
basic-deployment ec2_key_pair.pem  
→ ec2 git:(master) █
```

-> Use the below command to connect to ec2 instance

SSH -i ec2_key_pair.pem ec2-user@13.201.45.56

```
→ ec2 git:(master) x SSH -i ec2_key_pair.pem ec2-user@13.201.45.56  
@@@@@@@  
@       WARNING: UNPROTECTED PRIVATE KEY FILE!          @  
@  
Permissions 0644 for 'ec2_key_pair.pem' are too open.  
It is required that your private key files are NOT accessible by others.  
This private key will be ignored.  
Load key "ec2_key_pair.pem": bad permissions  
ec2-user@13.201.45.56: Permission denied (publickey,gssapi-keyex,gssapi-with-mic).  
→ ec2 git:(master) x █
```

→ You will see the permission error as you don't have permission to use the pem file. There are two ways to resolve this.

1. Using sudo

sudo SSH -i ec2_key_pair.pem ec2-user@13.201.45.56

```
→ ec2 git:(master) ✘ sudo SSH -i ec2_key_pair.pem ec2-user@13.201.45.56
Password:
,      #
~\_ ####_      Amazon Linux 2023
~~ \####\_
~~ \###|
~~ \#/ ___ https://aws.amazon.com/linux/amazon-linux-2023
~~ \~' '-'>
~~   /
~~ ._.  _/
~~ /_/
~~ /m/'

[ec2-user@ip-172-31-46-128 ~]$ █
```

2. Using chmod

chmod 0400 ec2_key_pair.pem

```
ec2-user@13.201.45.56: Permission denied (publickey,gssapi-keyex,gssapi-with-mic).
→ ec2 git:(master) ✘ chmod 0400 ec2_key_pair.pem
→ ec2 git:(master) ✘ SSH -i ec2_key_pair.pem ec2-user@13.201.45.56
,      #
~\_ ####_      Amazon Linux 2023
~~ \####\_
~~ \###|
~~ \#/ ___ https://aws.amazon.com/linux/amazon-linux-2023
~~ \~' '-'>
~~   /
~~ ._.  _/
~~ /_/
~~ /m/'

Last login: Sat Jan  6 01:53:57 2024 from 49.206.55.170
[ec2-user@ip-172-31-46-128 ~]$ █
```

→ Now we connected to ec2 instance that we created using ssh. Now we can tryout ping and create a folder for our spring boot app

```
Last login: Sat Jan  6 01:53:57 2024 from 49.206.55.170
[ec2-user@ip-172-31-46-128 ~]$ ping google.com
PING google.com (142.250.70.46) 56(84) bytes of data.
64 bytes from pnbomb-aa-in-f14.1e100.net (142.250.70.46): icmp_seq=1 ttl=51 time=2.12 ms
64 bytes from pnbomb-aa-in-f14.1e100.net (142.250.70.46): icmp_seq=2 ttl=51 time=2.03 ms
64 bytes from pnbomb-aa-in-f14.1e100.net (142.250.70.46): icmp_seq=3 ttl=51 time=2.06 ms
64 bytes from pnbomb-aa-in-f14.1e100.net (142.250.70.46): icmp_seq=4 ttl=51 time=2.03 ms
^C
--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3006ms
rtt min/avg/max/mdev = 2.025/2.056/2.115/0.035 ms
[ec2-user@ip-172-31-46-128 ~]$ █
```

```
[ec2-user@ip-172-31-46-128 ~]$ pwd
/home/ec2-user
[ec2-user@ip-172-31-46-128 ~]$ ls
[ec2-user@ip-172-31-46-128 ~]$ mkdir my-apps
[ec2-user@ip-172-31-46-128 ~]$ ls
my-apps
[ec2-user@ip-172-31-46-128 ~]$ █
```

Deploy Spring boot application into EC2 instance

-> we create a spring boot app with an endpoint and it will work in local as below :

The screenshot shows the Postman interface with a single request listed:

- Method:** GET
- URL:** <http://localhost:4455/hello/Gundamaiah>
- Headers:** (6)
- Body:** (Pretty, Raw, Preview, Visualize, Text, JSON)
- Response:**
 - Status: 200 OK
 - Time: 152 ms
 - Size: 262 B
 - Save Response

```
1 Hello Gundamaiah! How are you? I am from spring app and current time is 2024-01-06T07:31:55.499801
```

-> Build the jar using maven package command

The screenshot shows the IntelliJ IDEA interface with a Maven project named "basic-demo". The code editor displays Java files like `ZoneId.java` and `BasicDemoApplication.java`. The Maven tool window on the right shows the build log for the command `mvn clean package`. The log output is as follows:

```
[INFO] [INFO] Results:
[INFO]
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO] --- jar:3.3.0:jar (default-jar) @ basic-demo ---
[INFO] Building jar: /Users/gundamaiahannamaina/workspace/AWS_Demos/ec2/basic-deployment/basic-demo/target/basic-demo-1.0.jar
[INFO]
[INFO] --- spring-boot:3.2.1:repackage (repackage) @ basic-demo ---
[INFO] Replacing main artifact /Users/gundamaiahannamaina/workspace/AWS_Demos/ec2/basic-deployment/basic-demo/target/basic-demo-1.0.jar with /Users/gundamaiahannamaina/workspace/AWS_Demos/ec2/basic-deployment/basic-demo/target/basic-demo.jar
[INFO] The original artifact has been renamed to /Users/gundamaiahannamaina/workspace/AWS_Demos/ec2/basic-deployment/basic-demo/target/basic-demo-1.0.jar
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 11.207 s
[INFO] Finished at: 2024-01-06T07:33:36+05:30
[INFO] -----
```

At the bottom of the terminal window, it says "Process finished with exit code 0".

-> By above action, we can see the jar created under the target folder.

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project Bar:** Shows the project name "basic-demo" and branch "master".
- Project Tree:** Displays the project structure under "basic-demo":
 - src
 - main
 - java
 - com.example.basicdemo
 - BasicDemoApplication
 - application.properties
 - test
 - target
 - classes
 - generated-sources
 - generated-test-sources
 - maven-archiver
 - maven-status
 - surefire-reports
 - test-classes
 - myHelloApp.jar
 - myHelloApp.jar.original
 - .gitignore
 - basic-demo.iml
 - HELP.md
 - mvnw
 - mvnw.cmd
 - pom.xml
 - External Libraries
 - Scratches and Consoles
- Code Editor:** The file "BasicDemoApplication.java" is open at line 17. The code is as follows:

```
package com.example.basicdemo;
import ...

public class BasicDemoApplication {
    public static void main(String[] args) {
        @GetMapping("/hello/{name}")
        public String sayHello(
            @PathVariable String name) {
            return "Hello " + name + "! How are you?";
        }
    }
}
```
- Maven Tools:** Shows profiles and the current profile "basic-demo".

→ Deploy this into ec2 instance using scp command

```
scp -i ec2_key_pair.pem basic-deployment/basic-demo/target/myHelloApp.jar  
ec2-user@13.201.45.56:my-apps
```

```
→ ec2 git:(master) ✘ scp -i ec2_key_pair.pem basic-deployment/basic-demo/target/myHelloApp.jar ec2-user@13.201.45.56:my-apps  
myHelloApp.jar                                              100%   19MB  18.1MB/s   00:01  
→ ec2 git:(master) ✘
```

→ **Install Java on ec2 instance**

We required Java to run the jar that we copied, so install java using the below command in ec2 instance

sudo yum install java

```

[ec2-user@ip-172-31-46-128 my-apps]$ clean
[ec2-user@ip-172-31-46-128 my-apps]$ sudo yum install java
Last metadata expiration check: 0:27:03 ago on Sat Jan  6 01:47:34 2024.
Dependencies resolved.
=====
Package           Architecture Version      Repository   Size
=====
Installing:
  java-21-amazon-corretto          x86_64    1:21.0.1+12-1.amzn2023.2      amazonlinux 214 k
Installing dependencies:
  alsa-lib                         x86_64    1.2.7.2-1.amzn2023.0.1      amazonlinux 504 k
  cairo                           x86_64    1.17.6-2.amzn2023.0.1      amazonlinux 684 k
  dejavu-sans-fonts                noarch   2.37-16.amzn2023.0.2      amazonlinux 1.3 M
  dejavu-sans-mono-fonts           noarch   2.37-16.amzn2023.0.2      amazonlinux 467 k
  dejavu-serif-fonts               noarch   2.37-16.amzn2023.0.2      amazonlinux 1.0 M
  fontconfig                       x86_64    2.13.94-2.amzn2023.0.2      amazonlinux 273 k
  fonts-filesystem                 noarch   1:2.0.5-12.amzn2023.0.2      amazonlinux 9.5 k
  freetype                          x86_64    2.13.0-2.amzn2023.0.1      amazonlinux 422 k
  giflib                           x86_64    5.2.1-9.amzn2023.0.1      amazonlinux 49 k
  google-noto-fonts-common         noarch   20201206-2.amzn2023.0.2      amazonlinux 15 k
  google-noto-sans-vf-fonts       noarch   20201206-2.amzn2023.0.2      amazonlinux 492 k
  graphite2                        x86_64    1.3.14-7.amzn2023.0.2      amazonlinux 97 k
  harfbuzz                         x86_64    7.0.0-2.amzn2023.0.1      amazonlinux 868 k
  java-21-amazon-corretto-headless x86_64    1:21.0.1+12-1.amzn2023.2      amazonlinux 97 M
  javapackages-filesystem          noarch   6.0.0-7.amzn2023.0.6      amazonlinux 12 k
  langpacks-core-font-en           noarch   3.0-21.amzn2023.0.4      amazonlinux 10 k
  libICE                            x86_64    1.0.10-6.amzn2023.0.2      amazonlinux 71 k
  libSM                            x86_64    1.2.3-8.amzn2023.0.2      amazonlinux 42 k
  libX11                           x86_64    1.7.2-3.amzn2023.0.4      amazonlinux 657 k
=====
Verifying: .fonts-filesystem-1.2.0.5-12.amzn2023.0.2.noarch  34/35
Verifying: :javapackages-filesystem-6.0.0-7.amzn2023.0.6.noarch 35/35
=====
Installed:
  alsa-lib-1.2.7.2-1.amzn2023.0.2.x86_64
  dejavu-sans-fonts-2.37-16.amzn2023.0.2.noarch
  dejavu-serif-fonts-2.37-16.amzn2023.0.2.noarch
  fonts-filesystem-1:2.0.5-12.amzn2023.0.2.noarch
  giflib-5.2.1-9.amzn2023.0.1.x86_64
  google-noto-sans-vf-fonts-20201206-2.amzn2023.0.2.noarch
  harfbuzz-7.0.0-2.amzn2023.0.1.x86_64
  java-21-amazon-corretto-headless-1:21.0.1+12-1.amzn2023.2.x86_64
  langpacks-core-font-en-3.0-21.amzn2023.0.4.noarch
  libSM-1.2.3-8.amzn2023.0.2.x86_64
  libX11-common-1.7.2-3.amzn2023.0.4.noarch
  libXext-1.3.4-6.amzn2023.0.2.x86_64
  libXinerama-1.1.4-8.amzn2023.0.2.x86_64
  libXrender-0.9.10-14.amzn2023.0.2.x86_64
  libXtst-1.2.3-14.amzn2023.0.2.x86_64
  libjpeg-turbo-2.1.4-2.amzn2023.0.5.x86_64
  libxcb-1.13.1-7.amzn2023.0.2.x86_64
  xml-common-0.6.3-56.amzn2023.0.2.noarch
  cairo-1.17.6-2.amzn2023.0.1.x86_64
  dejavu-sans-mono-fonts-2.37-16.amzn2023.0.2.noarch
  fontconfig-2.13.94-2.amzn2023.0.2.x86_64
  freetype-2.13.0-2.amzn2023.0.1.x86_64
  google-noto-fonts-common-20201206-2.amzn2023.0.2.noarch
  graphite2-1.3.14-7.amzn2023.0.2.x86_64
  java-21-amazon-corretto-1:21.0.1+12-1.amzn2023.2.x86_64
  javapackages-filesystem-6.0.0-7.amzn2023.0.6.noarch
  libICE-1.0.10-6.amzn2023.0.2.x86_64
  libX11-1.7.2-3.amzn2023.0.4.x86_64
  libXau-1.0.9-6.amzn2023.0.2.x86_64
  libXi-1.7.10-6.amzn2023.0.2.x86_64
  libXrandr-1.5.2-6.amzn2023.0.2.x86_64
  libXt-1.2.0-4.amzn2023.0.2.x86_64
  libbrotli-1.0.9-4.amzn2023.0.2.x86_64
  libpng-2.1.6.37-10.amzn2023.0.6.x86_64
  pixman-0.40.0-3.amzn2023.0.3.x86_64
=====
Complete!
[ec2-user@ip-172-31-46-128 my-apps]$ 

```

→ Run the spring boot jar using Java command

java -jar myHelloApp.jar

→ Access the api using POSTMAN

<http://13.201.45.56:4455/hello/Gundamaiah>

http://13.201.45.56:4455/hello/Gundamaiah

Save ▾   

Send ▾

GET http://13.201.45.56:4455/hello/Gundamaiah

Params Authorization Headers (6) Body Pre-request Script Tests Settings Cookies

Query Params

KEY	VALUE	DESCRIPTION	...	Bulk Edit
Key	Value	Description		

Response

Could not send request

Error: Request timed out | [View in Console](#)

[Learn more about troubleshooting API requests](#)

Here we got timeout error , because we are running our app on port 4455 which is not open to connect in ec2 instance security group. So to open the port, add inbound rule that will allow the connections to ec2 instance for this port.

→ Add inbound rule in security group for port 4455

The screenshot shows the AWS EC2 Security Groups console. On the left, a sidebar navigation includes: Instances (Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations), 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, Trust Stores), and Auto Scaling (Auto Scaling Groups). The main content area displays the 'sg-0f87f47ee34b0c6cb - launch-wizard-1' security group. The 'Details' section shows: Security group name (launch-wizard-1), Security group ID (sg-0f87f47ee34b0c6cb), Description (launch-wizard-1 created 2024-01-06T01:45:19.124Z), Owner (479581134780), Inbound rules count (1 Permission entry), and Outbound rules count (1 Permission entry). Below this is the 'Inbound rules' table:

Name	Security group rule...	IP version	Type	Protocol	Port range	Source	Description
-	sgr-085e6d60eb0ae76a	IPv4	SSH	TCP	22	0.0.0.0/0	-

→ Click on edit Inbound rules to add a new rule

The screenshot shows the 'Edit inbound rules' page for the 'sg-0f87f47ee34b0c6cb - launch-wizard-1' security group. The top navigation bar includes: Services, Search, and Options. The main content area shows the 'Edit inbound rules' form. It has fields for: Security group rule ID (sgr-085e6d60eb0ae76a), Type (SSH), Protocol (TCP), Port range (22), Source (Custom, dropdown menu showing '0.0.0.0/0'), and Description (optional, empty field). A note at the bottom states: '⚠ Rules with source of 0.0.0.0 or ::/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.' At the bottom right are 'Cancel', 'Preview changes', and 'Save rules' buttons.

→ Add rule

Edit inbound rules Info

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

Security group rule ID	Type	Protocol	Port range	Source	Description - optional
sgr-085e6d60e6b0ae76a	SSH	TCP	22	Custom	<input type="text"/> 0.0.0.0/0 Delete
-	Custom TCP	TCP	4455	Anywhere-IPv4	<input type="text"/> 0.0.0.0/0 Delete

Add rule

⚠ Rules with source of 0.0.0.0 or ::/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Cancel Preview changes Save rules

Inbound security group rules successfully modified on security group sg-0f87f47ee34b0c6cb (sg-0f87f47ee34b0c6cb | launch-wizard-1)

Details

sg-0f87f47ee34b0c6cb - launch-wizard-1

Actions

Security group name	Security group ID	Description	VPC ID
launch-wizard-1	sg-0f87f47ee34b0c6cb	launch-wizard-1 created 2024-01-06T01:45:19.124Z	vpc-093a362e5d33caa56
Owner	479581134780	Inbound rules count 2 Permission entries	Outbound rules count 1 Permission entry

Inbound rules (2)

Name	Security group rule...	IP version	Type	Protocol	Port range	Source	Description
-	sgr-03bd8667fc9971f	IPv4	Custom TCP	TCP	4455	0.0.0.0/0	-
-	sgr-085e6d60e6b0ae76a	IPv4	SSH	TCP	22	0.0.0.0/0	-

→ Now we can access the api using port 4455

The screenshot shows the Postman interface with a single request in the workspace. The request is a GET to `http://13.201.45.56:4455/hello/Gundamaiah`. The response status is 200 OK, and the body contains the message: "Hello Gundamaiah! How are you? I am from spring app and current time is 2024-01-06T02:27:51.034Z".

Stop the spring boot application

-> To stop the spring boot app which is running on ec2 instance, we need to get PID of the process first by using the below command

ps -ef | grep java

```
[ec2-user@ip-172-31-46-128 ~]$ ps -ef | grep java
ec2-user 26306 3071 0 02:18 pts/1 00:00:07 java -jar myHelloApp.jar
ec2-user 26758 26679 0 02:33 pts/2 00:00:00 grep --color=auto java
[ec2-user@ip-172-31-46-128 ~]$
```

→ Now kill the process using the command

kill -9 26306

```
[ec2-user@ip-172-31-46-128 ~]$ ps -ef | grep java
ec2-user 26306 3071 0 02:18 pts/1 00:00:07 java -jar myHelloApp.jar
ec2-user 26758 26679 0 02:33 pts/2 00:00:00 grep --color=auto java
[ec2-user@ip-172-31-46-128 ~]$ kill -9 26306
[ec2-user@ip-172-31-46-128 ~]$
```

→ reverifying the running processes

```
..AWS_Demos/ec2 (-zsh)
[ec2-user@ip-172-31-46-128 ~]$ ps -ef | grep java
ec2-user 26306 3071 0 02:18 pts/1 00:00:07 java -jar myHelloApp.jar
ec2-user 26758 26679 0 02:33 pts/2 00:00:00 grep --color=auto java
[ec2-user@ip-172-31-46-128 ~]$ kill -9 26306
[ec2-user@ip-172-31-46-128 ~]$ ps -ef | grep java
ec2-user 26810 26679 0 02:35 pts/2 00:00:00 grep --color=auto java
[ec2-user@ip-172-31-46-128 ~]$
```

Now we will get connection refused error if we try to access the api

The screenshot shows the Postman application interface. A request is being made to the URL `http://13.201.45.56:4455/hello/Gundamaiah`. The method is set to `GET`. In the 'Params' tab, there is a single entry for 'Key' with the value 'Value'. The 'Headers' tab contains six entries. The 'Body' tab is empty. The 'Tests' and 'Settings' tabs are also visible. At the bottom of the request panel, there is a message: "Could not send request". Below this, an error message is displayed: "Error: connect ECONNREFUSED 13.201.45.56:4455 | View in Console". There is also a link to "Learn more about troubleshooting API requests". The bottom navigation bar includes icons for 'Find and Replace', 'Console', 'Runner', 'Trash', and a help icon.

Stop and the Terminate the EC2 Instance

As we are done with our basic demo, we need to clean up the resources, so we need to stop and terminate the ec2 instance now (we can terminate the ec2 instance directly as well)

→ Stop EC2 Instance

Screenshot of the AWS EC2 Instances page showing two EC2 instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Reboot instance	Elastic IP	IPv6 IPs
My First EC2 Instance	i-0557e729210eb5bc	Running	t2.micro	2/2 checks passed	View alarms	ap-south-1a	ec2-13-201-45	Start instance	-	-
My first EC2 Instance	i-0ca1756f6bb56a76	Terminated	t2.micro	-	View alarms	ap-south-1a	-	Hibernate instance	-	-

The "Stop instance" button is highlighted in the Actions menu for the first instance.

Screenshot of the AWS EC2 Instances page showing the same two EC2 instances. A modal dialog titled "Stop instance?" is displayed over the page.

Modal Content:

Stop instance?

Instance IDs
i-0557e729210eb5bc (My First EC2 Instance)

To confirm that you want to stop the instance, choose the Stop button below.

Cancel Step

The screenshot shows the AWS EC2 Instances page. A success message at the top left says "Successfully stopped i-0557e729210ebefbc". The main table displays two instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 IP	Elastic IP	IPv6 IPs
My first EC2 Instance	i-0ca1756f6bb566a76	Terminated	t2.micro	-	View alarms	ap-south-1a	-	-	-	-
My First EC2 Instance	i-0557e729210ebefbc	Stopped	t2.micro	-	View alarms	ap-south-1a	ec2-13-201-45-56.ap-s...	13.201.45.56	-	-

→ Terminate the EC2 instance

The screenshot shows the same AWS EC2 Instances page as before, but now the "Actions" dropdown menu has been opened for the second instance. The "Terminate instance" option is highlighted with a blue selection bar.

The screenshot shows the AWS EC2 Instances page. The left sidebar contains navigation links for EC2 Dashboard, EC2 Global View, Events, Instances (selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, 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, Trust Stores, and Auto Scaling.

The main content area displays two instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 IP	Elastic IP	IPv6 IP
My first EC2 instance	i-0ca1775060bb55a76	Terminated	t2.micro	-		ap-south-1a	-	-	-	-
My First EC2 Instance	i-0557e729210ebc5bc	Stopped	t2.micro	-		ap-south-1a	ec2-13-201-45-54.ap-south-1.compute.amazonaws.com	13.201.45.56	-	-

A modal dialog titled "Terminate instance?" is open for the second instance. It contains a warning message: "On an EBS-backed instance, the default action is for the root EBS volume to be deleted when the instance is terminated. Storage on any local drives will be lost." Below the message, it asks, "Are you sure you want to terminate these instances?". It shows the Instance ID "i-0557e729210ebc5bc (My First EC2 Instance)" and the "Termination protection" status as "Disabled". At the bottom, there are "Cancel" and "Terminate" buttons.

This screenshot shows the same AWS EC2 Instances page as the previous one, but with a different view. The "My First EC2 Instance" row is highlighted with a blue background, indicating it is selected. The rest of the interface is identical to the first screenshot, showing the list of instances and the "Terminate instance?" dialog.

*****END*****