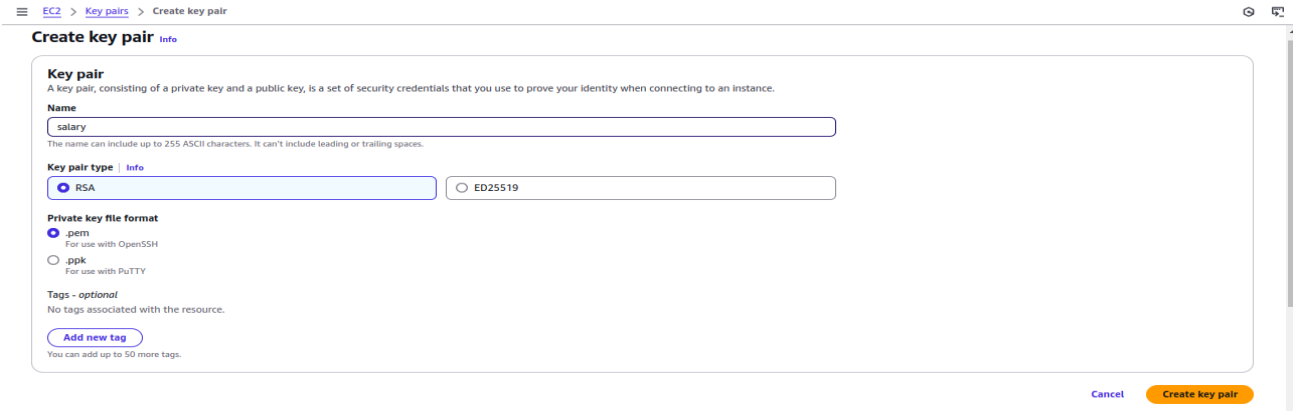
Steps to set up salary-api

Step 1: Configuring your AWS environment.

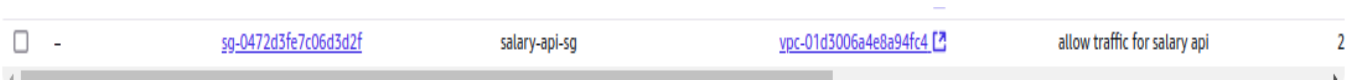
1. **Log in to the AWS account**:
   - Go to your AWS Management Console.

2. **Create an EC2 Instance**:
   - Go to the EC2 Dashboard.
   - Click **Launch Instance** and configure the following:
     - **AMI**: Ubuntu 22.04.
     - **Instance Type**: t2.medium.
     - **Key Pair**: Create or select an existing key pair.

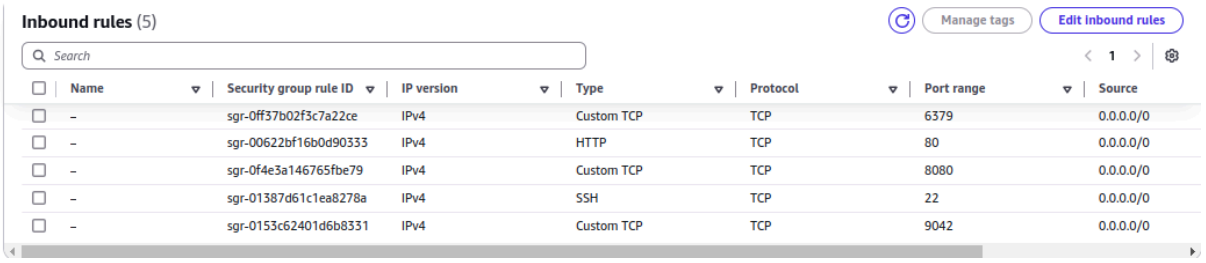
       To create a key pair, follow these steps -
       1. Go to key pairs and click on **Create key pair**.
       2. Provide the key name, key pair type, and key file format as per your requirement.



     - **Security Group**: **Inbound rules**:



       - 22 [for SSH]
       - 8080 [for web servers]
       - 80 [for HTTP]
       - 9042 [for ScyllaDB]
       - 6379 [for Redis]



Inbound rules (5)

Manage tags | Edit inbound rules

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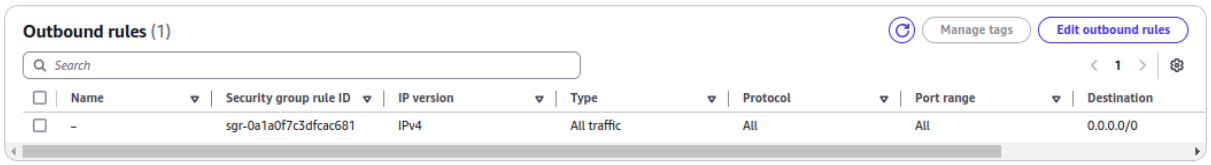
1

Name	Security group rule ID	IP version	Type	Protocol	Port range	Source
–	sgr-0ff37b02f3c7a22ce	IPv4	Custom TCP	TCP	6379	0.0.0.0/0
–	sgr-00622bf16b0d90333	IPv4	HTTP	TCP	80	0.0.0.0/0
–	sgr-0f4e3a146765fbe79	IPv4	Custom TCP	TCP	8080	0.0.0.0/0
–	sgr-01387d61c1ea8278a	IPv4	SSH	TCP	22	0.0.0.0/0
–	sgr-0153c62401d6b8331	IPv4	Custom TCP	TCP	9042	0.0.0.0/0

Outbound rules: Allow all traffic



Outbound rules (1)

Manage tags | Edit outbound rules

Search

1

Name	Security group rule ID	IP version	Type	Protocol	Port range	Destination
–	sgr-0a1a0f7c3dfcac681	IPv4	All traffic	All	All	0.0.0.0/0

Access the EC2 Instances:

- SSH into the EC2 instances using the following command:
  ssh -i your-key.pem ubuntu@<ip>

```
sheetal@sheetal:~/Downloads$ ssh -i salary.pem ubuntu@3.109.217.13
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 6.8.0-1021-aws x86_64)

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

 System information as of Thu Feb  6 05:02:01 UTC 2025

  System load:  0.0               Processes:             110
  Usage of /:   22.1% of 7.57GB   Users logged in:       1
  Memory usage: 5%                IPv4 address for eth0: 172.31.47.229
  Swap usage:   0%


Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status


The list of available updates is more than a week old.
To check for new updates run: sudo apt update
New release '24.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


Last login: Thu Feb  6 04:50:24 2025 from 13.233.177.3
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-47-229:~$
```

Verify the Key and its permissions.

1. Ensure the key file is correct:
   - Double-check that the pem key is the private key associated with the EC2 instance.
2. Ensure the key file has the correct permissions: **400.** [4 - user/owner, 0 - group, 0 - others].

   To set the required permissions to the key run the following command :
   Chmod 400 salary.pem

```
sheetal@sheetal:~/Downloads$ ll | grep salary.pem
-r--------  1 sheetal sheetal      1674 Feb  6 10:07 salary.pem
```

Step 2: Once we have the server ready, make sure to install all the dependencies that are required. The **dependencies** that we require are -

- **Maven**
- **Redis**
- **Migrate**
- **Sycalladb**
- **make**

Step 3: Scylla Installation, run the following commands.

sudo mkdir -p /etc/apt/keyrings

sudo gpg --homedir /tmp --no-default-keyring --keyring /etc/apt/keyrings/scylladb.gpg --keyserver hkp://keyserver.ubuntu.com:80 --recv-keys a43e06657bac99e3

sudo wget -O /etc/apt/sources.list.d/scylla.list

http://downloads.scylladb.com/deb/debian/scylla-6.2.list

sudo apt-get update

sudo apt-get install -y scylla

```
ubuntu@ip-172-31-47-229:~$ scylla --version
6.2.2-0.20241128.c6ef055e9c3b
ubuntu@ip-172-31-47-229:~$
```

Step 4: Make some changes to the scylla.yaml

sudo vi /etc/scylla/scylla.yaml
seeds: private ip

```
        # For example: "<IP1>,<IP2>,<IP3>"
        - seeds: "172.31.47.229"
```

listen_address: private ip

```
# If you set broadcast_address, then you can set listen_address to 0.0.0.0.
listen_address: 172.31.47.229
```

rpc_address: private ip

```
# ipv4. If there is only one address it will be selected regardless of ipv4/ipv6.
rpc_address: 172.31.47.229
# rpc_interface: eth1
```

add the below code in scylla.yaml-----

authenticator: PasswordAuthenticator
authorizer: CassandraAuthorizer

```
authenticator: PasswordAuthenticator
authorizer: CassandraAuthorizer
"/etc/scylla/scylla.yaml" 623L, 28306B
```

Step 5: Configure the I/O settings for ScyllaDB.

sudo /opt/scylladb/scripts/scylla_io_setup

```
ubuntu@ip-172-31-47-229:~$ sudo /opt/scylladb/scripts/scylla_io_setup
/opt/scylladb/scripts/libexec/scylla_io_setup:41: SyntaxWarning: invalid escape sequence '\s'
  pattern = re.compile(_nocomment + r"CPUSET=\s*\"" + _reopt(_cpuset) + _reopt(_smp) + "\s*\"")
ERROR:root:Filesystem at /var/lib/scylla/data has only 5742342144 bytes available; that is less than the recommended 10 GB. Please free up space and run scy
lla_io_setup again.

ubuntu@ip-172-31-47-229:~$
```

Error: Disk space error.

Solution: Resize the volume.

- Stop the instance.
- Go to the **EC2 Console** → **Volumes**, select your root volume, and modify its size to 15GiB
- Restart the instance after the resize.

```
ubuntu@ip-172-31-47-229:~$ sudo /opt/scylladb/scripts/scylla_io_setup
/opt/scylladb/scripts/libexec/scylla_io_setup:41: SyntaxWarning: invalid escape sequence '\s'
  pattern = re.compile(_nocomment + r"CPUSET=\s*\"" + _reopt(_cpuset) + _reopt(_smp) + "\s*\"")
tuning /sys/devices/vbd-768/block/xvda/xvda1
tuning /sys/devices/vbd-768/block/xvda
tuning: /sys/devices/vbd-768/block/xvda/queue/nomerges 2
tuning /sys/devices/vbd-768/block/xvda/xvda1
tuning /sys/devices/vbd-768/block/xvda/xvda1
tuning /sys/devices/vbd-768/block/xvda/xvda1
INFO  2025-02-06 06:11:30,484 seastar - Reactor backend: linux-aio
INFO  2025-02-06 06:11:31,466 [shard 0:main] iotune - /var/lib/scylla/view_hints passed sanity checks
WARN  2025-02-06 06:11:31,467 [shard 0:main] iotune - Scheduler for /sys/devices/vbd-768/block/xvda/queue/scheduler set to mq-deadline. It is recommend to s
et it to noop before evaluation so as not to skew the results.
INFO  2025-02-06 06:11:31,467 [shard 0:main] iotune - Disk parameters: max_iodepth=64 disks_per_array=1 minimum_io_size=512
INFO  2025-02-06 06:11:31,467 [shard 0:main] iotune - Filesystem parameters: read alignment 4096, write alignment 4096
Starting Evaluation. This may take a while...
Measuring sequential write bandwidth: 61 MB/s (deviation 10%)
Measuring sequential read bandwidth: 65 MB/s (deviation 22%)
Measuring random write IOPS: 3292 IOPS (deviation 26%)
Measuring random read IOPS: 3060 IOPS
Writing result to /etc/scylla.d/io_properties.yaml
Writing result to /etc/scylla.d/io.conf
ubuntu@ip-172-31-47-229:~$
```

Start the Scylla server and check its status.

```
ubuntu@ip-172-31-47-229:~$ sudo systemctl start scylla-server
ubuntu@ip-172-31-47-229:~$ sudo systemctl status scylla-server.service
● scylla-server.service - Scylla Server
     Loaded: loaded (/lib/systemd/system/scylla-server.service; disabled; vendor preset: enabled)
    Drop-In: /etc/systemd/system/scylla-server.service.d
             └─capabilities.conf, dependencies.conf, sysconfdir.conf
     Active: active (running) since Thu 2025-02-06 06:23:25 UTC; 21s ago
    Process: 2168 ExecStartPre=/opt/scylladb/scripts/scylla_prepare (code=exited, status=0/SUCCESS)
   Main PID: 2175 (scylla)
     Status: "serving"
      Tasks: 4 (limit: 4676)
     Memory: 148.0M
        CPU: 20.940s
     CGroup: /scylla.slice/scylla-server.slice/scylla-server.service
             └─2175 /usr/bin/scylla --log-to-syslog 1 --log-to-stdout 0 --default-log-level info --network-stack posix --io-properties-file=/etc/scylla.d/i>

Feb 06 06:23:26 ip-172-31-47-229 scylla[2175]:  [shard 0:comp] compaction - [Compact system.local dfc62250-e452-11ef-8f1b-4f1cd87fceeb] Compacted 2 sstable>
Feb 06 06:23:26 ip-172-31-47-229 scylla[2175]:  [shard 0:comp] compaction - [Compact system.raft dfd47a30-e452-11ef-8f1b-4f1cd87fceeb] Compacting [/var/lib>
Feb 06 06:23:26 ip-172-31-47-229 scylla[2175]:  [shard 0:comp] sstable - Rebuilding bloom filter /var/lib/scylla/data/system/raft-3e17774c57f539939625327cb>
Feb 06 06:23:26 ip-172-31-47-229 scylla[2175]:  [shard 0:comp] compaction - [Compact system.raft dfd47a30-e452-11ef-8f1b-4f1cd87fceeb] Compacted 6 sstables>
Feb 06 06:23:26 ip-172-31-47-229 scylla[2175]:  [shard 0:comp] compaction - [Compact system_schema.columns dfe59130-e452-11ef-8f1b-4f1cd87fceeb] Compacting>
Feb 06 06:23:26 ip-172-31-47-229 scylla[2175]:  [shard 0:comp] sstable - Rebuilding bloom filter /var/lib/scylla/data/system_schema/columns-24101c25a2ae3af>
Feb 06 06:23:26 ip-172-31-47-229 scylla[2175]:  [shard 0:comp] compaction - [Compact system_schema.columns dfe59130-e452-11ef-8f1b-4f1cd87fceeb] Compacted >
Feb 06 06:23:26 ip-172-31-47-229 scylla[2175]:  [shard 0:comp] compaction - [Compact system.group0_history dff6cf40-e452-11ef-8f1b-4f1cd87fceeb] Compacting>
Feb 06 06:23:26 ip-172-31-47-229 scylla[2175]:  [shard 0:comp] sstable - Rebuilding bloom filter /var/lib/scylla/data/system/group0_history-027e42f5683a3ed>
Feb 06 06:23:26 ip-172-31-47-229 scylla[2175]:  [shard 0:comp] compaction - [Compact system.group0_history dff6cf40-e452-11ef-8f1b-4f1cd87fceeb] Compacted >
```

Check the Cassandra cluster for node information, with the help of the following command:
nodetool status

```
ubuntu@ip-172-31-47-229:~$ nodetool status
Datacenter: datacenter1
=======================
Status=Up/Down
|/ State=Normal/Leaving/Joining/Moving
-- Address       Load      Tokens Owns Host ID                              Rack
UN 172.31.47.229 272.97 KB 256    ?    6b6cd9de-ac61-4141-a53f-21fdddbf5d98 rack1

Note: Non-system keyspaces don't have the same replication settings, effective ownership information is meaningless
```

The status shows **UN** which means up and normal.

Step 6: Connect to Cassandra using cqlsh: cqlsh 172.31.47.229 -u cassandra -p cassandra

Create a new user scylladb: `CREATE USER scylladb WITH PASSWORD 'password' NOSUPERUSER;`

Grant all permissions to the new user: `GRANT ALL PERMISSIONS ON ALL KEYSPACES TO scylladb;`

Create employee_salary keyspace: `CREATE KEYSPACE IF NOT EXISTS employee_salary WITH replication = {'class': 'SimpleStrategy', 'replication_factor': 1};`

Create employee_DB keyspace: `CREATE KEYSPACE IF NOT EXISTS employee_DB WITH replication = {'class': 'SimpleStrategy', 'replication_factor': 1};`

Describe keyspaces: `Describe keyspaces;`

```
cassandra@cqlsh> Describe keyspaces;

employee_db      system       system_distributed            system_schema
employee_salary  system_auth  system_distributed_everywhere  system_traces

cassandra@cqlsh>
```

Switch to employee_db keyspace: use employee_db;

```
cassandra@cqlsh> use employee_db;
cassandra@cqlsh:employee_db>
```

Create the employee_salary table: CREATE TABLE IF NOT EXISTS

```
employee_salary (
   id text,
   process_date text,
   name text,
   salary float,
   status text,
   PRIMARY KEY (id, process_date)
) WITH CLUSTERING ORDER BY (process_date DESC);
```

```
cassandra@cqlsh:employee_db> DESCRIBE TABLES;

employee_salary
```

```
cassandra@cqlsh:employee_db> DESCRIBE TABLE employee_salary;

CREATE TABLE employee_db.employee_salary (
    id text,
    process_date text,
    name text,
    salary float,
    status text,
    PRIMARY KEY (id, process_date)
) WITH CLUSTERING ORDER BY (process_date DESC)
    AND bloom_filter_fp_chance = 0.01
    AND caching = {'keys': 'ALL', 'rows_per_partition': 'ALL'}
    AND comment = ''
    AND compaction = {'class': 'SizeTieredCompactionStrategy'}
    AND compression = {'sstable_compression': 'org.apache.cassandra.io.compress.LZ4Compressor'}
    AND crc_check_chance = 1
    AND default_time_to_live = 0
    AND gc_grace_seconds = 864000
    AND max_index_interval = 2048
    AND memtable_flush_period_in_ms = 0
    AND min_index_interval = 128
    AND speculative_retry = '99.0PERCENTILE'
    AND tombstone_gc = {'mode': 'timeout', 'propagation_delay_in_seconds': '3600'};
```

Exit the cqlsh session: exit.

Step 7: Redis installation. Run the following commands -
sudo apt-get install lsb-release curl gpg

curl -fsSL https://packages.redis.io/gpg | sudo gpg --dearmor -o /usr/share/keyrings/redis-archive-keyring.gpg

sudo chmod 644 /usr/share/keyrings/redis-archive-keyring.gpg

echo "deb [signed-by=/usr/share/keyrings/redis-archive-keyring.gpg] https://packages.redis.io/deb $(lsb_release -cs) main" | sudo tee /etc/apt/sources.list.d/redis.list

sudo apt-get update

sudo apt-get install redis

sudo systemctl enable redis-server

sudo systemctl start redis-server

```
ubuntu@ip-172-31-47-229:~$ redis-cli -v
redis-cli 7.4.2
```

Configure Redis - sudo vi /etc/redis/redis.conf
bind <private ip>

```
bind 127.0.0.1 -::1 172.31.47.229
```

Connect to Redis: redis-cli

```
ubuntu@ip-172-31-47-229:~/salary-api$ redis-cli
127.0.0.1:6379> ping
PONG
127.0.0.1:6379>
```

Grant the user Scylla permission to run all Redis commands: ACL SETUSER scylla on >password ~* +@all

```
ubuntu@ip-172-31-47-229:~$ redis-cli
127.0.0.1:6379> ACL SETUSER scylla on >password ~* +@all
OK
127.0.0.1:6379>
```

Step 8: Install Maven with the help of the following commands:
sudo apt install maven -y

```
ubuntu@ip-172-31-47-229:~$ mvn -v
Apache Maven 3.6.3
Maven home: /usr/share/maven
Java version: 11.0.26, vendor: Ubuntu, runtime: /usr/lib/jvm/java-11-openjdk-amd64
Default locale: en, platform encoding: UTF-8
OS name: "linux", version: "6.8.0-1021-aws", arch: "amd64", family: "unix"
```

Step 9: Install JAVA 17.

sudo apt install openjdk-17-jre-headless -y

```
ubuntu@ip-172-31-47-229:~$ java --version
openjdk 17.0.14 2025-01-21
OpenJDK Runtime Environment (build 17.0.14+7-Ubuntu-122.04.1)
OpenJDK 64-Bit Server VM (build 17.0.14+7-Ubuntu-122.04.1, mixed mode, sharing)
```

Step 10: Install make.

sudo apt install make -y

```
ubuntu@ip-172-31-47-229:~$ make --version
GNU Make 4.3
Built for x86_64-pc-linux-gnu
Copyright (C) 1988-2020 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.
```

Step 11: Install migrate.

curl -s https://packagecloud.io/install/repositories/golang-migrate/migrate/script.deb.sh | sudo bash

sudo apt update

sudo apt install migrate -y

```
ubuntu@ip-172-31-47-229:~$ migrate -version
4.18.2
ubuntu@ip-172-31-47-229:~$
```

Step 12: install jq.

sudo apt install jq -y

```
ubuntu@ip-172-31-47-229:~$ jq --version
jq-1.6
ubuntu@ip-172-31-47-229:~$
```

Step 13: Clone the salary-api repo.

git clone https://github.com/OT-MICROSERVICES/salary-api.git

```
ubuntu@ip-172-31-47-229:~$ git clone https://github.com/OT-MICROSERVICES/salary-api.git
Cloning into 'salary-api'...
remote: Enumerating objects: 168, done.
remote: Counting objects: 100% (45/45), done.
remote: Compressing objects: 100% (19/19), done.
remote: Total 168 (delta 32), reused 26 (delta 26), pack-reused 123 (from 1)
Receiving objects: 100% (168/168), 153.71 KiB | 6.40 MiB/s, done.
Resolving deltas: 100% (46/46), done.
ubuntu@ip-172-31-47-229:~$ l
salary-api/
```

Step 14: Configure additional settings to interact with the database.

- Switch to salary-api directory.

```
ubuntu@ip-172-31-47-229:~$ cd salary-api/
ubuntu@ip-172-31-47-229:~/salary-api$ ls
Dockerfile  LICENSE  Makefile  README.md  migration  migration.json  mvnw  mvnw.cmd  pom.xml  src  static
```

- Replace the IP with your private IP in migration.json: Sudo vi migration.json

```
{
  "database": "cassandra://172.31.47.229:9042/employee_db?username=scylladb&password=password"
}
```

- /src/main/resources/application.yml - 172.31.47.229

```
spring:
  cassandra:
    keyspace-name: employee_db
    contact-points: 172.31.47.229
    port: 9042
    username: scylladb
    password: password
    local-datacenter: datacenter1
  data:
    redis:
      host: 172.31.47.229
      port: 6379
      password: password
```

- /src/test/resources/application.yml - 172.31.47.229

```
spring:
  cassandra:
    keyspace-name: employee_db
    contact-points: 172.31.47.229
    port: 9042
    username: scylladb
    password: password
    local-datacenter: datacenter1
  data:
    redis:
      host: 172.31.47.229
      port: 6379
      password: password
```

Step 15: Update the OpenAPIConfig.java file.

sudo vi src/main/java/com/opstree/microservice/salary/config/OpenAPIConfig.java

[replace the localhost URL in the devServer setup with the public IP address of your server]

```
@Bean
public OpenAPI myOpenAPI() {
  Server devServer = new Server();
  devServer.setUrl("http://13.235.247.44:8080");
  devServer.setDescription("Server URL in Development environment");
```

And add the following block.

```
@Bean
  public CorsFilter corsFilter() {
    CorsConfiguration config = new CorsConfiguration();
    config.addAllowedOrigin("*"); // Allows requests from any origin
    config.addAllowedMethod("*"); // Allows all HTTP methods (GET, POST, PUT, DELETE, etc.)
    config.addAllowedHeader("*"); // Allows all headers
    UrlBasedCorsConfigurationSource source = new UrlBasedCorsConfigurationSource();
    source.registerCorsConfiguration("/", config); // Apply CORS settings to all endpoints
    return new CorsFilter(source);
  }
}
```

Step 16: Update the OpenAPIConfigTests.java file.
sudo vi
src/test/java/com/opstree/microservice/salary/config/OpenAPIConfigTests.java

[replace localhost with your server public ip this line -
assertEquals("http://localhost:8080", server.getUrl());]

```
        // Verify the server details
        assertEquals(1, openAPI.getServers().size());
        Server server = openAPI.getServers().get(0);
        assertEquals("http://13.235.247.44:8080", server.getUrl());
        assertEquals("Server URL in Development environment", server.getDescription());
```

Step 17: Run the following commands.

- make run-migrations
- make build

```
[INFO] Replacing main artifact /home/ubuntu/salary-api/target/salary-0.1.0-RELEASE.jar with rep
[INFO] The original artifact has been renamed to /home/ubuntu/salary-api/target/salary-0.1.0-RE
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  30.810 s
[INFO] Finished at: 2025-02-06T09:27:25Z
[INFO] ------------------------------------------------------------------------
ubuntu@ip-172-31-47-229:~/salary-api$
```

- make fmt
- make test
- java -jar target/salary-0.1.0-RELEASE.jar

```
ubuntu@ip-172-31-47-229:~/salary-api$ java -jar target/salary-0.1.0-RELEASE.jar

  .   ____          _            __ _ _
 /\\ / ___'_ __ _ _(_)_ __  __ _ \ \ \ \
( ( )\___ | '_ | '_| | '_ \/ _` | \ \ \ \
 \\/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_\__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::                (v3.1.1)

{"@timestamp":"2025-02-06T09:28:53.404Z","@version":"1","message":"Starting SalaryApplication v0.1.0-RELEASE using Java 17.0.14 with PID 11735 (/home/ubuntu
/salary-api/target/salary-0.1.0-RELEASE.jar started by ubuntu in /home/ubuntu/salary-api)","logger_name":"com.opstree.microservice.salary.SalaryApplication"
,"thread_name":"main","level":"INFO","level_value":20000}
```

Step 18: Hit the address.

http://ipaddress:8080/salary-documentation