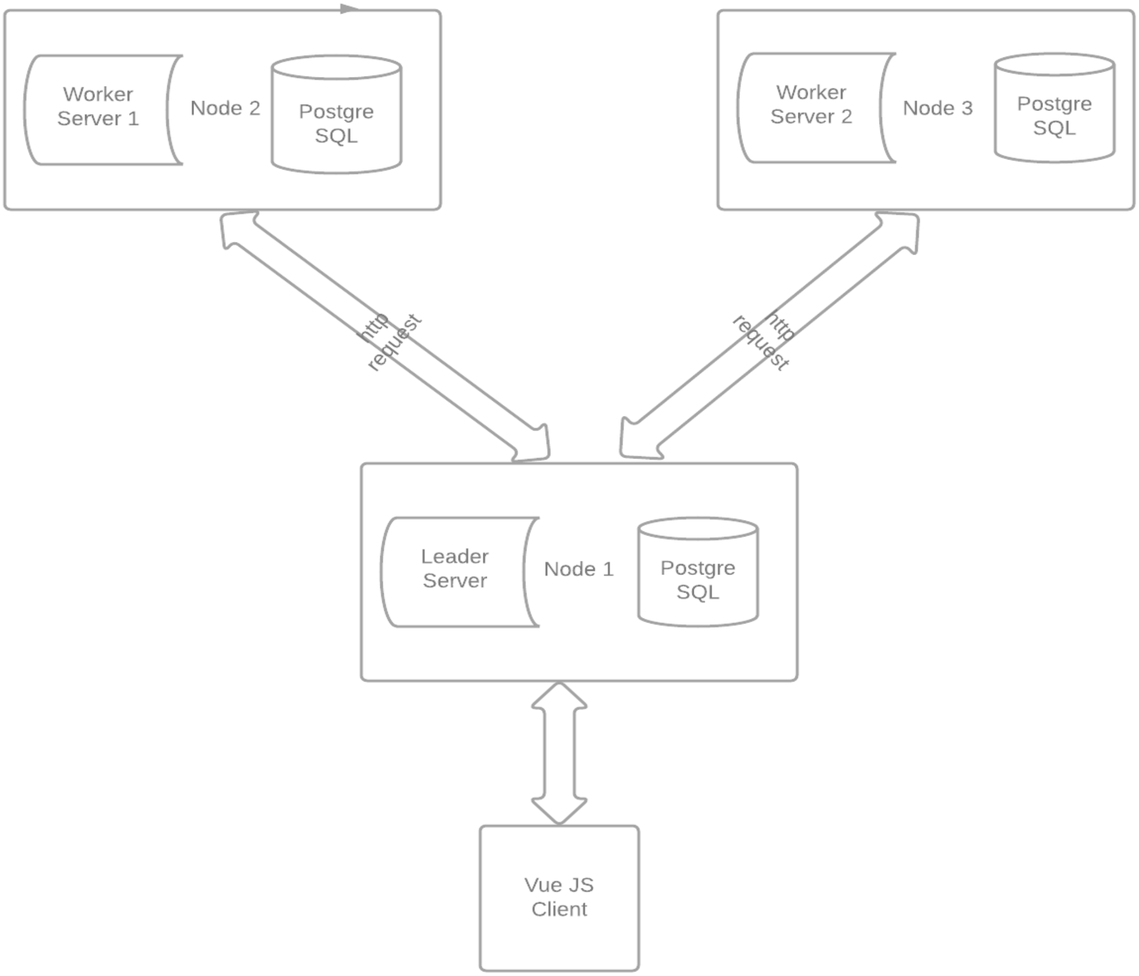
EXPENSES TRACKER

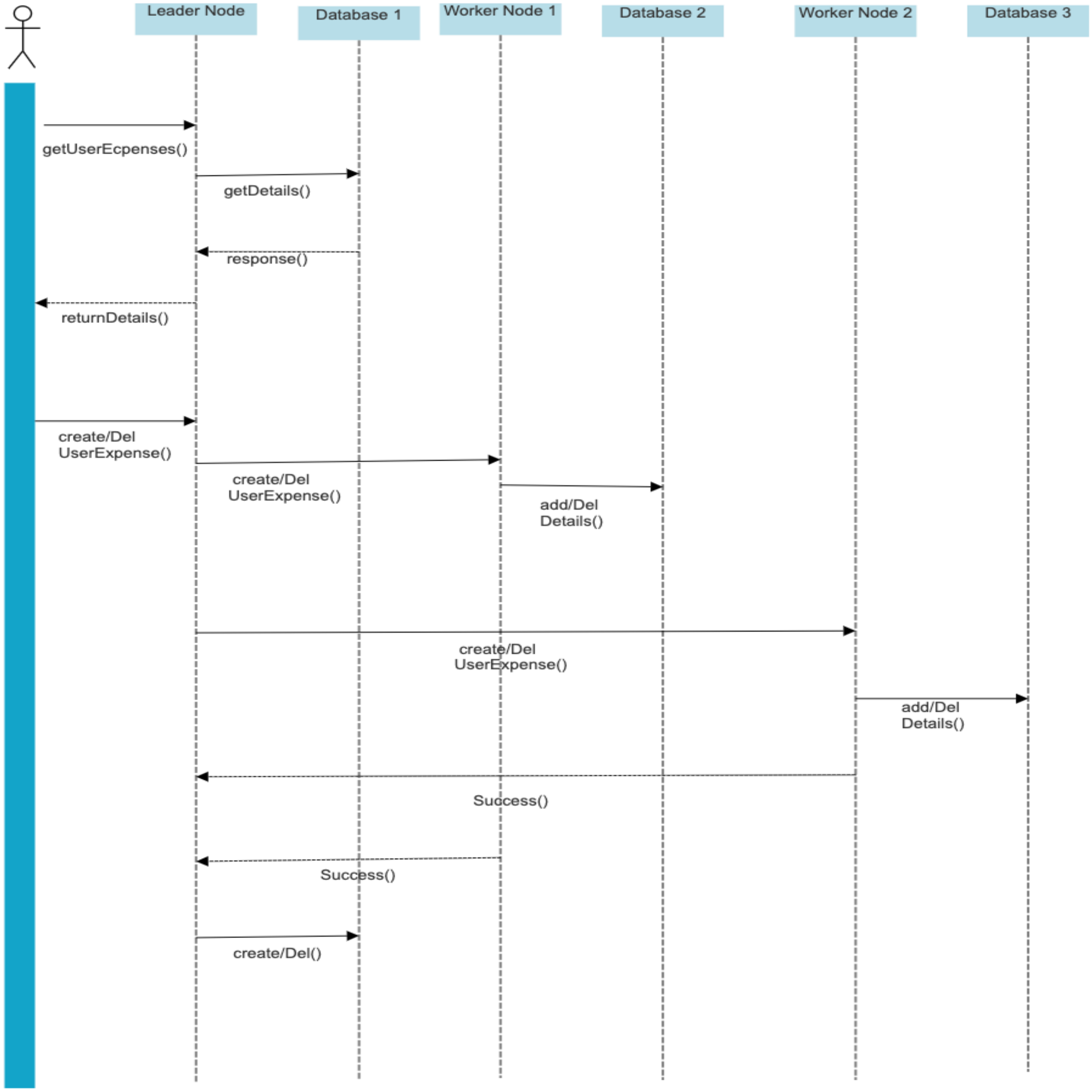
Introduction

As a part of the expenses tracker, the client sends a request to Leader-Node . Client request is forwarded to the other servers by the Leader node first. As soon as the leader receives an ACK from other servers, the leader executes the client request. The other servers will also execute the exact same client request which was forwarded by the leader. In the end, all 3 nodes should always have the same data.

Design Overview



Sequence Diagram



Implementation

Tech stacks used:

Front end: Vue.js

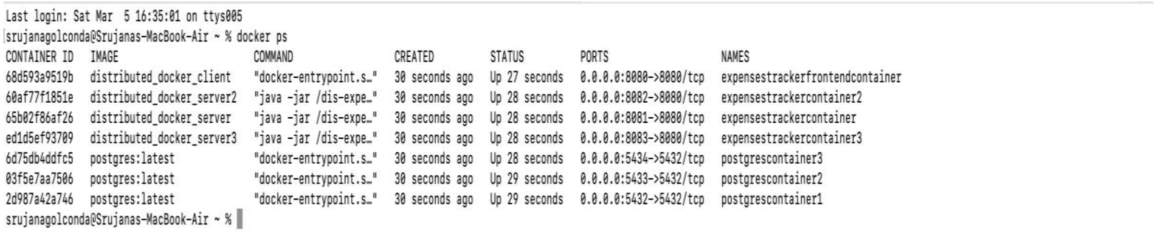
Back end: Spring Boot

Database: PostgreSQL

In this Expenses Tracker system, client would be able to view, add and, delete their expenses. Initially, client's request will be redirected to the Leader Node(Server) which would be forwarded to the other two worker Nodes as a part of http request. Both the nodes perform the operation and sends an ACK to the leader node stating that the request was successfully completed. As soon as the leader node receives an acknowledgment, the leader node performs the same task. The client would receive the information from the Leader node if requested for any. Ultimately, all the three nodes should have the same data always.

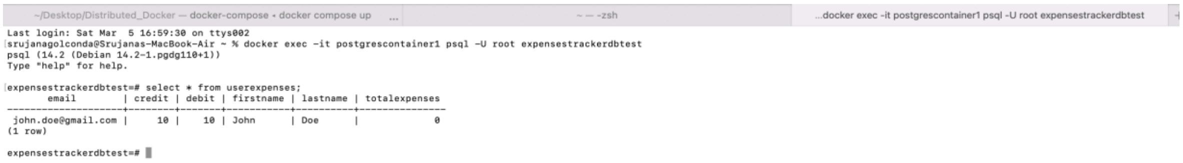
Validation

We can see the 7 containers running successfully.

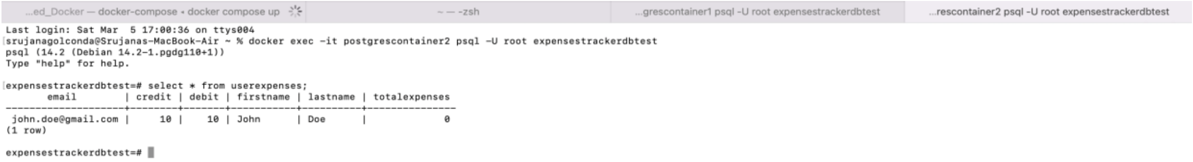


```
Last login: Sat Mar  5 16:35:01 on ttys005
srujanagolconda@Srujanas-MacBook-Air ~ % docker ps
CONTAINER ID   IMAGE                        COMMAND                  CREATED          STATUS          PORTS                    NAMES
68d593a9519b   distributed_docker_client    "docker-entrypoint.s…"   30 seconds ago   Up 27 seconds   0.0.0.0:8080->8080/tcp   expensestrackerfrontendcontainer
60af77f1851e   distributed_docker_server2   "java -jar /dis-expe…"   30 seconds ago   Up 28 seconds   0.0.0.0:8082->8080/tcp   expensestrackercontainer2
65b02f86af26   distributed_docker_server    "java -jar /dis-expe…"   30 seconds ago   Up 28 seconds   0.0.0.0:8081->8080/tcp   expensestrackercontainer
ed1d5ef93709   distributed_docker_server3   "java -jar /dis-expe…"   30 seconds ago   Up 28 seconds   0.0.0.0:8083->8080/tcp   expensestrackercontainer3
6d75db4ddfc5   postgres:latest              "docker-entrypoint.s…"   30 seconds ago   Up 28 seconds   0.0.0.0:5434->5432/tcp   postgrescontainer3
03f5e7aa7506   postgres:latest              "docker-entrypoint.s…"   30 seconds ago   Up 29 seconds   0.0.0.0:5433->5432/tcp   postgrescontainer2
2d987a42a746   postgres:latest              "docker-entrypoint.s…"   30 seconds ago   Up 29 seconds   0.0.0.0:5432->5432/tcp   postgrescontainer1
srujanagolconda@Srujanas-MacBook-Air ~ %
```

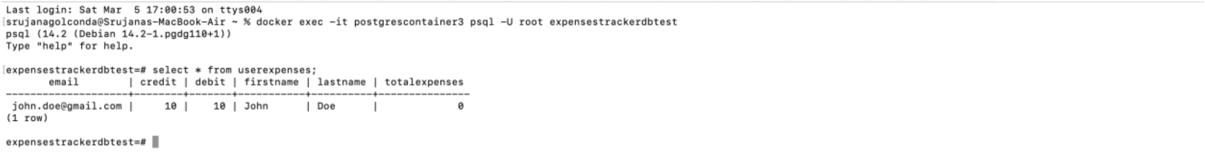
Ultimately, all three nodes have the same data always as shown below.


~/Desktop/Distributed_Docker — docker-compose • docker compose up
~ — -zsh
...docker exec -it postgrescontainer1 psql -U root expensestrackerdbtest

```
Last login: Sat Mar  5 16:59:30 on ttys002
srujanagolconda@Srujanas-MacBook-Air ~ % docker exec -it postgrescontainer1 psql -U root expensestrackerdbtest
psql (14.2 (Debian 14.2-1.pgdg110+1))
Type "help" for help.

expensestrackerdbtest=# select * from userexpenses;
       email        | credit | debit | firstname | lastname | totalexpenses
--------------------+--------+-------+-----------+----------+---------------
 john.doe@gmail.com |     10 |    10 | John      | Doe      |             0
(1 row)

expensestrackerdbtest=#
```


...ed_Docker — docker-compose • docker compose up
~ — -zsh
...grescontainer1 psql -U root expensestrackerdbtest
...rescontainer2 psql -U root expensestrackerdbtest

```
Last login: Sat Mar  5 17:00:36 on ttys004
srujanagolconda@Srujanas-MacBook-Air ~ % docker exec -it postgrescontainer2 psql -U root expensestrackerdbtest
psql (14.2 (Debian 14.2-1.pgdg110+1))
Type "help" for help.

expensestrackerdbtest=# select * from userexpenses;
       email        | credit | debit | firstname | lastname | totalexpenses
--------------------+--------+-------+-----------+----------+---------------
 john.doe@gmail.com |     10 |    10 | John      | Doe      |             0
(1 row)

expensestrackerdbtest=#
```



```
Last login: Sat Mar  5 17:00:53 on ttys004
srujanagolconda@Srujanas-MacBook-Air ~ % docker exec -it postgrescontainer3 psql -U root expensestrackerdbtest
psql (14.2 (Debian 14.2-1.pgdg110+1))
Type "help" for help.

expensestrackerdbtest=# select * from userexpenses;
       email        | credit | debit | firstname | lastname | totalexpenses
--------------------+--------+-------+-----------+----------+---------------
 john.doe@gmail.com |     10 |    10 | John      | Doe      |             0
(1 row)

expensestrackerdbtest=#
```

References

https://vuejs.org/guide/introduction.html

https://docs.spring.io/spring-boot/docs/current/reference/htmlsingle/

https://www.docker.com/