REPUBLIQUE TUNISIENNE
Ministère de l'Enseignement Supérieur
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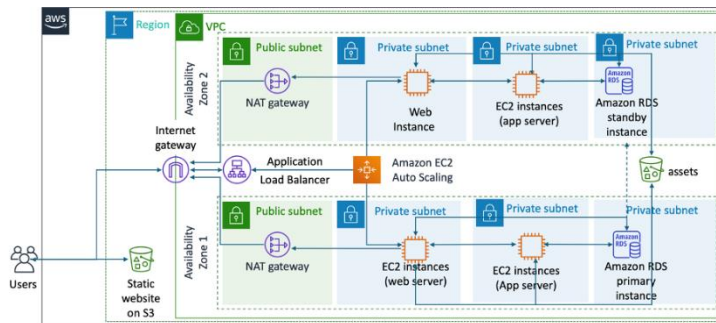
Rapport de projet Cloud :

Traité par :

Atef Amor

1-Objectif :

Le but de ce TP est de réaliser une architecture AWS pour déployer sur laquelle une application à 3 niveaux

2-Création du VPC :

Pour cette étape on accède au VPC management console et on crée une nouvelle VPC sous le nom de « atef-vpc » et on lui associe une adresse Ipv4 10.0.0.0/16.

L'étape suivante consiste à créer les subnets publics et privés dans deux AZ (east1a-east1b). Notre architecture comporte 8 subnets en totalité divisé sur deux AZ la première AZ contient les Subnets suivantes :

- Public-subnet-az1   10.0.1.0/24
- Private-web-subnet-az1 10.0.2.0/24
- Private-app-subnet- az1 10.0.3.0/24
- Private-db-subnet-az 1   10.0.4.0/24

La deuxième AZ contient les Subnets suivantes :
- Public-subnet-az2   10.0.5.0/24
- Private-web-subnet-az2 10.0.6.0/24
- Private-app-subnet-az2   10.0.7.0/24

- Private-db-subnet-az2   10.0.8.0/24

création du subnet public

Création du subnet privé web az1

Création de tous subnets de la même maniéré

Création de l'internet Gateway et son attachement à « atef-vpc »

3-Création des Nat Gateways:

Création du Nat Gateway pour l'az1

Création du Nat Gateway pour l'az2

4-Tables de routage :

Création table de routage (public-RT)

Edit routes

Destination	Target	Status	Propagated
10.0.0.0/16	local ▾ / Q local ✕	⊘ Active	No
Q 0.0.0.0/0 ✕	Internet Gateway ▾ / Q igw-0d277c8bff7265cde ✕	–	No	Remove

Add route

Cancel Preview **Save changes**

Diriger le traffic ver l'intgtw

VPC > Route tables > rtb-0bda414055d423f6f > Edit subnet associations

Edit subnet associations

VPC > Route tables > rtb-00f54d725ce5b4f1a > Edit routes

Edit routes

Route 1

Destination	Target	Status
10.0.0.0/16	local ▾ / Q local ✕	⊘ Active

Propagated
No

Route 2

Destination	Target	Status
Q 0.0.0.0/0 ✕	NAT Gateway ▾ / Q nat-06c63dfe7bf3e3ce9 ✕	–

Propagated
No

Remove

Add route

Cancel Preview **Save changes**

Associer les deux subnets publics

VPC > Route tables > Create route table
VPC > Route tables > rtb-00f54d725ce5b4f1a > Edit subnet associations

Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (2/8)

Q Filter subnet associations

< 1 > ⚙

	Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
☐	private-db-subnet-az2	subnet-07f2a9eabff85f...	10.0.8.0/24	–	Main (rtb-077398f2502f45
☑	private-web-subnet-az1	subnet-05d1749cc4250...	10.2.0/24	–	Main (rtb-077398f2502f45
☐	public-subnet-az2	subnet-0a12442496d7...	10.5.0/24	–	rtb-0bda414055d423f6f /
☐	private-web-subnet-az2	subnet-001f7699a550c...	10.6.0/24	–	Main (rtb-077398f2502f45
☐	private-db-subnet-az1	subnet-08f61e0fb9c72...	10.4.0/24	–	Main (rtb-077398f2502f45
☐	public-subnet-az1	subnet-0a7ea7fcd06aea...	10.1.0/24	–	rtb-0bda414055d423f6f /
☑	private-app-subnet-az1	subnet-0e2b69a2696bc...	10.3.0/24	–	Main (rtb-077398f2502f45
☐	private-app-subnet-az2	subnet-04c394daad9e2...	10.7.0/24	–	Main (rtb-077398f2502f45

Selected subnets

subnet-05d1749cc42502bf8 / private-web-subnet-az1 ✕   subnet-0e2b69a2696bcf2b4 / private-app-subnet-az1 ✕

Associer les subnets privés appropriées

On termine l'autre table de routage « private-rt-az2 » de la même manière.

Vérifier la création de tous les tables de routage

5-Les groupes de sécurités :

sg de la machine bastion

sg de LB public(external)

sg pour les instances web

SG pour le LB privé(internal)

sg pour les instances app

sg pour database(RDS)

Vérifier la création de tous les sgs

6-Création de RDS :

Création du subnet groupe de la bd

Création du RDS dans les deux az

Celui de l'az1est primary et celui de l'az2 est standby

7-Création des instances :

Création de l'instance bastion-az1

Détails sur la création de l'instance Bastion :

Sélection de l'image appropriée-az1

Génération d'une key pour l'accès ssh

Choisir le VPC et le SG

Activer le DNS hostname

On suit les méme étapes pour créer l'instance bastion-az2

Creation de l'instance bastion-az2

Creation de l'instance web-az1

On suit les mêmes étapes de la création de l'instance bastion sauf :

Cette instance est privée donc l'auto assign public IP doit être (disable)

On suit les méme étapes pour créer l'instance web-az2

Pour créer les instances app ,on suit les mêmes étapes de la création des instance web,mais on change seulement la configuration réseau :

Choisir le VPC et le SG appropriés pour app-az1

Choisir le VPC et le SG appropriés pour app-az2

Vérifier la création de toutes les instances

8-Vérification de la connexion ssh :

Activer le service ssh-agent à travers le PowerShell

Ajouter la clé « same-key »

Connecter à la machine bastion-az1 en utilisant sa @ip public

Connecter à l'instance app-az 1 en utilisant sa @ip privée

9-Création du s3 Bucket :

Nommer le S3 bucket

Configuration du S3 Bucket

Upload de la partie backend de l'application

Upload de la partie frontend de l'application

Vérifier l'upload

Upload du fichier de configuration nginx

10-Configuration des instances app :

Se connecter à l'instance app-az1

Configuration de la base de données :

```
[ec2-user@ip-10-0-3-108 ~]$ sudo yum install mysql -y
Loaded plugins: extras_suggestions, langpacks, priorities,
              : update-motd
amzn2-core                              | 3.6 kB     00:00
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.rp | 8.8 MB    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
  Verifying  : 1:mariadb-5.5.68-1.amzn2.0.1.x86_64      1/1

Installed:
  mariadb.x86_64 1:5.5.68-1.amzn2.0.1
```

Installer MySQL

```
[ec2-user@ip-10-0-3-108 ~]$ mysql -h database-1-instance-1.cmahgi5zy9pe.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 227
Server version: 5.7.12 MySQL Community Server (GPL)

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)]>
```

Connecter à MySQL

```
MySQL [(none)]> CREATE DATABASE webappdl
Query OK, 1 row affected (0.01 sec)

MySQL [(none)]> SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| sys                |
| webappdb           |
+--------------------+
5 rows in set (0.01 sec)
```

Créer la base de données et vérifier sa création

```
MySQL [(none)]> USE webappdb;
Database changed
MySQL [webappdb]> CREATE TABLE IF NOT EXISTS transactions(id INT NOT NULL AUTO_IN
REMENT, amount DECIMAL(10,2), description VARCHAR(100), PRIMARY KEY(id));
Query OK, 0 rows affected (0.05 sec)

MySQL [webappdb]>
```

Créer la table

```
MySQL [webappdb]> SHOW TABLES;
+-------------------+
| Tables_in_webappdb |
+-------------------+
| transactions      |
+-------------------+
1 row in set (0.01 sec)
```

Vérifier la création de la table

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

Insérer une ligne et tester

```js
JS DbConfig.js X

hree-tier-web-architecture-workshop > application-code > app-tier > JS DbConfig.js > [∅] <unknowr
1   module.exports = Object.freeze({
2       DB_HOST : 'database-1-instance-1.cmahgi5zy9pe.us-east-1.rds.
        amazonaws.com',
3       DB_USER : 'admin',
4       DB_PWD : 'atefatef',
5       DB_DATABASE : 'webappdb'
6   });
```

Modifier les paramétres de connexion à la base de données

```
MySQL [webappdb]> exit
Bye
[ec2-user@ip-10-0-3-108 ~]$ 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   520k      0 --:--:-- --:--:-- --:--:--  539k
=> 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
t 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
vm bash_completion
```

```
[ec2-user@ip-10-0-3-108 ~]$ source ~/.bashrc
[ec2-user@ip-10-0-3-108 ~]$ |
```

```
[ec2-user@ip-10-0-3-108 ~]$ 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...
################################################################### 100.
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-10-0-3-108 ~]$ nvm use 16
Now using node v16.20.2 (npm v8.19.4)
[ec2-user@ip-10-0-3-108 ~]$ npm install -g pm2
npm WARN deprecated uuid@3.4.0: Please upgrade  to version 7 or higher.  Older v
sions may use Math.random() in certain circumstances, which is known to be probl
atic.  See https://v8.dev/blog/math-random for details.

added 162 packages, and audited 163 packages in 8s

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

found 0 vulnerabilities
npm notice
npm notice New major version of npm available! 8.19.4 -> 10.5.1
npm notice Changelog: https://github.com/npm/cli/releases/tag/v10.5.1
npm notice Run npm install -g npm@10.5.1 to update!
npm notice
```

Installation de node.js

```
[ec2-user@ip-10-0-3-108 ~]$ cd ~/
[ec2-user@ip-10-0-3-108 ~]$ aws s3 cp s3://atef-bucket/app-tier/ app-tier --recur
ive
download: s3://atef-bucket/app-tier/TransactionService.js to app-tier/Transaction
ervice.js
download: s3://atef-bucket/app-tier/README.md to app-tier/README.md
download: s3://atef-bucket/app-tier/DbConfig.js to app-tier/DbConfig.js
download: s3://atef-bucket/app-tier/index.js to app-tier/index.js
download: s3://atef-bucket/app-tier/package.json to app-tier/package.json
download: s3://atef-bucket/app-tier/package-lock.json to app-tier/package-lock.js
n
```

```
[ec2-user@ip-10-0-3-108 ~]$ cd ~/app-tier
[ec2-user@ip-10-0-3-108 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-10-0-3-108 app-tier]$ pm2 start index.js

                        -------------

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  _\/\\_____\/\\\_\/\\\//\\\____/\\\//\\\_\///_____\//\\\__
   _\/\\\\\\\\\\\\\/__\/\\\\///\\\/\\\/_\/\\_____/\\\/___
    _\/\\\/////////____\/\\\__\///\\\/___\/\\_____/\\\//_____
     _\/\\_____\/\\\____\///_____\/\\\_____/\\\//_____
      _\/\\_____\/\\_____\/\\\___/\\\/_____
       _\/\\_____\/\\_____\/\\\__/\\\\\\\\\\\\\\\_
        _\///_____\///_____\///__\///////////////__

                        Runtime Edition

        PM2 is a Production Process Manager for Node.js applications
                   with a built-in Load Balancer.

                Start and Daemonize any application:
                $ pm2 start app.js

                Load Balance 4 instances of api.js:
                $ pm2 start api.js -i 4

                Monitor in production:
                $ pm2 monitor

                Make pm2 auto-boot at server restart:
                $ pm2 startup

                To go further checkout:
                http://pm2.io/

                        -------------

[PM2] Spawning PM2 daemon with pm2_home=/home/ec2-user/.pm2
[PM2] PM2 Successfully daemonized
[PM2] Starting /home/ec2-user/app-tier/index.js in fork_mode (1 instance)
[PM2] Done.
```

id	name	mode	↺	status	cpu	memory
0	index	fork	0	online	0%	25.4mb

```
[ec2-user@ip-10-0-3-108 app-tier]$ pm2 list
```

id	name	mode	↺	status	cpu	memory
0	index	fork	0	online	0%	51.8mb

```
[ec2-user@ip-10-0-3-108 app-tier]$ pm2 logs
[TAILING] Tailing last 15 lines for [all] processes (change the value with --lines option)
/home/ec2-user/.pm2/pm2.log last 15 lines:
PM2          | 2024-04-04T04:40:27: PM2 log: PM2 version         : 5.3.1
PM2          | 2024-04-04T04:40:27: PM2 log: Node.js version     : 16.20.2
PM2          | 2024-04-04T04:40:27: PM2 log: Current arch        : x64
PM2          | 2024-04-04T04:40:27: PM2 log: PM2 home            : /home/ec2-user/.pm2
PM2          | 2024-04-04T04:40:27: PM2 log: PM2 PID file        : /home/ec2-user/.pm2/pm2.pid
PM2          | 2024-04-04T04:40:27: PM2 log: RPC socket file     : /home/ec2-user/.pm2/rpc.sock
PM2          | 2024-04-04T04:40:27: PM2 log: BUS socket file     : /home/ec2-user/.pm2/pub.sock
PM2          | 2024-04-04T04:40:27: PM2 log: Application log path : /home/ec2-user/.pm2/logs
PM2          | 2024-04-04T04:40:27: PM2 log: Worker Interval     : 30000
PM2          | 2024-04-04T04:40:27: PM2 log: Process dump file   : /home/ec2-user/.pm2/dump.pm2
PM2          | 2024-04-04T04:40:27: PM2 log: Concurrent actions  : 2
PM2          | 2024-04-04T04:40:27: PM2 log: SIGTERM timeout     : 1600
PM2          | 2024-04-04T04:40:27: PM2 log: ===================================================================
PM2          | 2024-04-04T04:40:27: PM2 log: App [index:0] starting in -fork mode-
PM2          | 2024-04-04T04:40:27: PM2 log: App [index:0] online

/home/ec2-user/.pm2/logs/index-error.log last 15 lines:
/home/ec2-user/.pm2/logs/index-out.log last 15 lines:
0|index    | AB3 backend app listening at http://localhost:4000
[ec2-user@ip-10-0-3-108 app-tier]$ sudo env PATH=$PATH:/home/ec2-user/.nvm/versions/node/v16.20.2/bin /home/ec2-user/.nvm/versions/node/v16
0.2/lib/node_modules/pm2/bin/pm2 startup systemd -u ec2-user --hp /home/ec2-user
                           -------------

                 __/\\\\\\\\\___/\\_____/\\\___/\\\\\\___
                 _\/\\\////////___\/\\_____/\\\\\_____/\\\///\\\___
                  _\/\\_____\/\\_____/\\\/___\///\\\__\///_____/\\\/__
                   _\/\\\//////////___\/\\\_/\\//\\\__\/\\\____/\\_____/\\\/____
                    _\/\\_____\/\\\///\\\/\\\__\/\\\____\/\\\___/\\\/_____
                     _\/\\_____\/\\\___\///____\/\\\____\/\\\___/\\\/_____
                      _\/\\_____\/\\_____\/\\\___/\\\\\\\\\\\\\\\_
                       _\///_____\///_____\///___\///////////////__


                           Runtime Edition

        PM2 is a Production Process Manager for Node.js applications
                      with a built-in Load Balancer.

             Start and Daemonize any application:
             $ pm2 start app.js

             Load Balance 4 instances of api.js:
             $ pm2 start api.js -i 4

             Monitor in production:
             $ pm2 monitor

             Make pm2 auto-boot at server restart:
             $ pm2 startup

             To go further checkout:
             http://pm2.io/

                           -------------

[PM2] Init System found: systemd
Platform systemd
Template
[Unit]
Description=PM2 process manager
Documentation=https://pm2.keymetrics.io/
After=network.target

                           -------------

[PM2] Init System found: systemd
Platform systemd
Template
[Unit]
Description=PM2 process manager
Documentation=https://pm2.keymetrics.io/
After=network.target

[Service]
Type=forking
User=ec2-user
LimitNOFILE=infinity
LimitNPROC=infinity
LimitCORE=infinity
Environment=PATH=/home/ec2-user/.nvm/versions/node/v16.20.2/bin:/usr/local/bin:/usr/bin:/usr/local/sbin:/usr/sbin:/home/ec2-user/.local/bin:
home/ec2-user/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...
Created symlink from /etc/systemd/system/multi-user.target.wants/pm2-ec2-user.service to /etc/systemd/system/pm2-ec2-user.service.
[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-10-0-3-108 app-tier]$ pm2 save
[PM2] Saving current process list...
[PM2] Successfully saved in /home/ec2-user/.pm2/dump.pm2
[ec2-user@ip-10-0-3-108 app-tier]$
```

```
[ec2-user@ip-10-0-3-108 app-tier]$ curl http://localhost:4000/health
"This is the health check"[ec2-user@ip-10-0-3-108 app-tier]$
```

```
[ec2-user@ip-10-0-3-108 app-tier]$ curl http://localhost:4000/transaction
{"result":[{"id":1,"amount":400,"description":"groceries"}]}[ec2-user@ip-10-0-3-108 app-tier]$
```

Configuration et test

ON refait le méme travail pour app-az2

11-configuration des instances web :

```
    root    /home/ec2-user/web-tier/build;
    index index.html index.htm
    try_files $uri /index.html;
    }

    #proxy for internal lb
    location /api/{
            proxy_pass http://internal-lb-app-809362591.us-east-1.
            elb.amazonaws.com:80/;
    }


}
```

Ajouter le DNS de LB public

```
[ec2-user@ip-10-0-1-211 ~]$ ssh 10.0.2.170
The authenticity of host '10.0.2.170 (10.0.2.170)' can't be established.
ECDSA key fingerprint is SHA256:j0mWNZOtcVH1qiNQxC0whwco+LABlcFamXPF0ekG29U.
ECDSA key fingerprint is MD5:2e:86:ed:20:bb:c1:fd:6b:29:ec:46:7c:db:14:41:cd.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.0.2.170' (ECDSA) to the list of known hosts.
       #_
  ~\_  ####_        Amazon Linux 2
 ~~  \_#####\
 ~~      \###|       AL2 End of Life is 2025-06-30.
 ~~       \#/ ___
  ~~       V~' '->
   ~~~         /     A newer version of Amazon Linux is available!
     ~~._.   _/
        _/ _/       Amazon Linux 2023, GA and supported until 2028-03-15.
      _/m/'            https://aws.amazon.com/linux/amazon-linux-2023/
```

Connection à web-az1

```
[ec2-user@ip-10-0-2-170 ~]$ 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   569k      0 --:--:-- --:--:-- --:--:--  583k
=> 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" ] && \. "$NVM_DIR/bash_completion"  # This loads nvm bash_completion
[ec2-user@ip-10-0-2-170 ~]$ source ~/.bashrc
[ec2-user@ip-10-0-2-170 ~]$ 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...
################################################################################################################## 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-10-0-2-170 ~]$ nvm use 16
Now using node v16.20.2 (npm v8.19.4)
```

```
[ec2-user@ip-10-0-2-170 ~]$ cd ~/
[ec2-user@ip-10-0-2-170 ~]$ aws s3 cp s3://atef-bucket/web-tier/ web-tier --recursive
download: s3://atef-bucket/web-tier/public/index.html to web-tier/public/index.html
download: s3://atef-bucket/web-tier/src/components/DatabaseDemo/DatabaseDemo.css to web-tier/src/components/DatabaseDemo/DatabaseDemo.cs
download: s3://atef-bucket/web-tier/README.md to web-tier/README.md
download: s3://atef-bucket/web-tier/public/robots.txt to web-tier/public/robots.txt
download: s3://atef-bucket/web-tier/package.json to web-tier/package.json
download: s3://atef-bucket/web-tier/src/components/DatabaseDemo/DatabaseDemo.js to web-tier/src/components/DatabaseDemo/DatabaseDemo.js
download: s3://atef-bucket/web-tier/src/.DS_Store to web-tier/src/.DS_Store
download: s3://atef-bucket/web-tier/src/components/Menu/Menu.styled.js to web-tier/src/components/Menu/Menu.styled.js
download: s3://atef-bucket/web-tier/src/App.css to web-tier/src/App.css
download: s3://atef-bucket/web-tier/src/components/Menu/index.js to web-tier/src/components/Menu/index.js
download: s3://atef-bucket/web-tier/src/components/index.js to web-tier/src/components/index.js
download: s3://atef-bucket/web-tier/src/components/Home/Home.js to web-tier/src/components/Home/Home.js
download: s3://atef-bucket/web-tier/src/components/.DS_Store to web-tier/src/components/.DS_Store
download: s3://atef-bucket/web-tier/src/components/Menu/Menu.js to web-tier/src/components/Menu/Menu.js
download: s3://atef-bucket/web-tier/src/components/Burger/index.js to web-tier/src/components/Burger/index.js
download: s3://atef-bucket/web-tier/src/hooks.js to web-tier/src/hooks.js
download: s3://atef-bucket/web-tier/src/App.js to web-tier/src/App.js
download: s3://atef-bucket/web-tier/src/index.js to web-tier/src/index.js
download: s3://atef-bucket/web-tier/src/components/Burger/Burger.styled.js to web-tier/src/components/Burger/Burger.styled.js
download: s3://atef-bucket/web-tier/src/index.css to web-tier/src/index.css
download: s3://atef-bucket/web-tier/src/theme.js to web-tier/src/theme.js
download: s3://atef-bucket/web-tier/src/App.test.js to web-tier/src/App.test.js
download: s3://atef-bucket/web-tier/src/components/Burger/Burger.js to web-tier/src/components/Burger/Burger.js
download: s3://atef-bucket/web-tier/src/reportWebVitals.js to web-tier/src/reportWebVitals.js
download: s3://atef-bucket/web-tier/src/assets/3TierArch.png to web-tier/src/assets/3TierArch.png
download: s3://atef-bucket/web-tier/src/setupTests.js to web-tier/src/setupTests.js
download: s3://atef-bucket/web-tier/src/global.js to web-tier/src/global.js
```

```
[ec2-user@ip-10-0-2-170 ~]$ cd ~/web-tier
[ec2-user@ip-10-0-2-170 web-tier]$ npm install
npm WARN deprecated sourcemap-codec@1.4.8: Please use @jridgewell/sourcemap-codec instead
npm WARN deprecated rollup-plugin-terser@7.0.2: This package has been deprecated and is no longer maintained. Please use @rollup/plugin-t
erser
npm WARN deprecated workbox-cacheable-response@6.6.0: workbox-background-sync@6.6.0
npm WARN deprecated stable@0.1.8: Modern JS already guarantees Array#sort() is a stable sort, so this library is deprecated. See the comp
tibility table on MDN: https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Array/sort#browser_compatibility
npm WARN deprecated workbox-google-analytics@6.6.0: It is not compatible with newer versions of GA starting with v4, as long as you are u
ing GAv3 it should be ok, but the package is not longer being maintained
npm WARN deprecated w3c-hr-time@1.0.2: Use your platform's native performance.now() and performance.timeOrigin.
npm WARN deprecated domexception@2.0.1: Use your platform's native DOMException instead
npm WARN deprecated abab@2.0.6: Use your platform's native atob() and btoa() methods instead
npm WARN deprecated @babel/plugin-proposal-private-methods@7.18.6: This proposal has been merged to the ECMAScript standard and thus this
 plugin is no longer maintained. Please use @babel/plugin-transform-private-methods instead.
npm WARN deprecated @babel/plugin-proposal-optional-chaining@7.21.0: This proposal has been merged to the ECMAScript standard and thus th
s plugin is no longer maintained. Please use @babel/plugin-transform-optional-chaining instead.
npm WARN deprecated @babel/plugin-proposal-numeric-separator@7.18.6: This proposal has been merged to the ECMAScript standard and thus th
s plugin is no longer maintained. Please use @babel/plugin-transform-numeric-separator instead.
npm WARN deprecated @babel/plugin-proposal-nullish-coalescing-operator@7.18.6: This proposal has been merged to the ECMAScript standard a
d thus this plugin is no longer maintained. Please use @babel/plugin-transform-nullish-coalescing-operator instead.
npm WARN deprecated @babel/plugin-proposal-class-properties@7.18.6: This proposal has been merged to the ECMAScript standard and thus thi
 plugin is no longer maintained. Please use @babel/plugin-transform-class-properties instead.
npm WARN deprecated svgo@1.3.2: This SVGO version is no longer supported. Upgrade to v2.x.x.

added 1513 packages, and audited 1514 packages in 1m

264 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.
npm notice
npm notice New major version of npm available! 8.19.4 -> 10.5.1
npm notice Changelog: https://github.com/npm/cli/releases/tag/v10.5.1
npm notice Run npm install -g npm@10.5.1 to update!
npm notice
```

```
[ec2-user@ip-10-0-2-170 web-tier]$ npm run build

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

Creating an optimized production build...
One of your dependencies, babel-preset-react-app, is importing the
"@babel/plugin-proposal-private-property-in-object" package without
declaring it in its dependencies. This is currently working because
"@babel/plugin-proposal-private-property-in-object" is already in your
node_modules folder for unrelated reasons, but it may break at any time.

babel-preset-react-app is part of the create-react-app project, which
is not maintianed anymore. It is thus unlikely that this bug will
ever be fixed. Add "@babel/plugin-proposal-private-property-in-object" to
your devDependencies to work around this error. This will make this message
go away.

Compiled successfully.

File sizes after gzip:

  74.86 kB    build/static/js/main.3b141034.js
  1.79 kB     build/static/js/453.a4ec9c9e.chunk.js
  493 B       build/static/css/main.b20b6ac4.css

The project was built assuming it is hosted at ./.
You can control this with the homepage field in your package.json.

The build folder is ready to be deployed.

Find out more about deployment here:

  https://cra.link/deployment
```

```
[ec2-user@ip-10-0-2-170 web-tier]$ sudo amazon-linux-extras install nginx1 -y
Installing nginx
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
Cleaning repos: amzn2-core amzn2extra-docker amzn2extra-kernel-5.10 amzn2extra-nginx1
17 metadata files removed
6 sqlite files removed
0 metadata files removed
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
amzn2-core                                                      | 3.6 kB  00:00:00
amzn2extra-docker                                               | 2.9 kB  00:00:00
amzn2extra-kernel-5.10                                          | 3.0 kB  00:00:00
amzn2extra-nginx1                                               | 2.9 kB  00:00:00
(1/9): amzn2-core/2/x86_64/group_gz                             | 2.7 kB  00:00:00
(2/9): amzn2-core/2/x86_64/updateinfo                          | 832 kB  00:00:00
(3/9): amzn2extra-docker/2/x86_64/updateinfo                   |  15 kB  00:00:00
(4/9): amzn2extra-nginx1/2/x86_64/updateinfo                   | 3.0 kB  00:00:00
(5/9): amzn2extra-docker/2/x86_64/primary_db                  | 106 kB  00:00:00
(6/9): amzn2extra-nginx1/2/x86_64/primary_db                  |  55 kB  00:00:00
(7/9): amzn2extra-kernel-5.10/2/x86_64/updateinfo             |  55 kB  00:00:00
(8/9): amzn2extra-kernel-5.10/2/x86_64/primary_db             |  24 MB  00:00:00
(9/9): amzn2-core/2/x86_64/primary_db                         |  73 MB  00:00:01
Resolving Dependencies
--> Running transaction check
---> Package nginx.x86_64 1:1.22.1-1.amzn2.0.3 will be installed
--> Processing Dependency: nginx-core = 1:1.22.1-1.amzn2.0.3 for package: 1:nginx-1.22.1-1.amzn2.0.3.x86_64
--> Processing Dependency: nginx-filesystem = 1:1.22.1-1.amzn2.0.3 for package: 1:nginx-1.22.1-1.amzn2.0.3.x86_64
--> Running transaction check
---> Package nginx-core.x86_64 1:1.22.1-1.amzn2.0.3 will be installed
--> Processing Dependency: libcrypto.so.1.1(OPENSSL_1_1_0)(64bit) for package: 1:nginx-core-1.22.1-1.amzn2.0.3.x86_64
--> Processing Dependency: libssl.so.1.1(OPENSSL_1_1_0)(64bit) for package: 1:nginx-core-1.22.1-1.amzn2.0.3.x86_64
--> Processing Dependency: libssl.so.1.1(OPENSSL_1_1_1)(64bit) for package: 1:nginx-core-1.22.1-1.amzn2.0.3.x86_64
--> Processing Dependency: libcrypto.so.1.1()(64bit) for package: 1:nginx-core-1.22.1-1.amzn2.0.3.x86_64
--> Processing Dependency: libprofiler.so.0()(64bit) for package: 1:nginx-core-1.22.1-1.amzn2.0.3.x86_64
--> Processing Dependency: libssl.so.1.1()(64bit) for package: 1:nginx-core-1.22.1-1.amzn2.0.3.x86_64
---> Package nginx-filesystem.noarch 1:1.22.1-1.amzn2.0.3 will be installed
--> Running transaction check
---> Package gperftools-libs.x86_64 0:2.6.1-1.amzn2 will be installed
---> Package openssl11-libs.x86_64 1:1.1.1g-12.amzn2.0.20 will be installed
--> Processing Dependency: openssl11-pkcs11 for package: 1:openssl11-libs-1.1.1g-12.amzn2.0.20.x86_64
--> Running transaction check
---> Package openssl11-pkcs11.x86_64 0:0.4.10-6.amzn2.0.1 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

=================================================================================
 Package              Arch         Version                  Repository        Size
=================================================================================
Installing:
 nginx                x86_64       1:1.22.1-1.amzn2.0.3     amzn2extra-nginx1   55 k
Installing for dependencies:
 gperftools-libs      x86_64       2.6.1-1.amzn2            amzn2-core         274 k
 nginx-core           x86_64       1:1.22.1-1.amzn2.0.3     amzn2extra-nginx1  559 k
 nginx-filesystem     noarch       1:1.22.1-1.amzn2.0.3     amzn2extra-nginx1   25 k
 openssl11-libs       x86_64       1:1.1.1g-12.amzn2.0.20   amzn2-core         1.4 M
 openssl11-pkcs11     x86_64       0.4.10-6.amzn2.0.1       amzn2-core          61 k

Transaction Summary
=================================================================================
Install  1 Package (+5 Dependent packages)

Total download size: 2.4 M
Installed size: 6.7 M
```

```
Total download size: 2.4 M
Installed size: 6.7 M
Downloading packages:
(1/6): nginx-1.22.1-1.amzn2.0.3.x86_64.rpm                                    |  55 kB  00:00:00
(2/6): nginx-core-1.22.1-1.amzn2.0.3.x86_64.rpm                               | 559 kB  00:00:00
(3/6): gperftools-libs-2.6.1-1.amzn2.x86_64.rpm                               | 274 kB  00:00:00
(4/6): nginx-filesystem-1.22.1-1.amzn2.0.3.noarch.rpm                         |  25 kB  00:00:00
(5/6): openssl11-pkcs11-0.4.10-6.amzn2.0.1.x86_64.rpm                         |  61 kB  00:00:00
(6/6): openssl11-libs-1.1.1g-12.amzn2.0.20.x86_64.rpm                         | 1.4 MB  00:00:00
---------------------------------------------------------------------------------------------------
Total                                                             6.4 MB/s | 2.4 MB  00:00:00
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : openssl11-pkcs11-0.4.10-6.amzn2.0.1.x86_64                                      1/6
  Installing : 1:openssl11-libs-1.1.1g-12.amzn2.0.20.x86_64                                    2/6
  Installing : 1:nginx-filesystem-1.22.1-1.amzn2.0.3.noarch                                    3/6
  Installing : gperftools-libs-2.6.1-1.amzn2.x86_64                                            4/6
  Installing : 1:nginx-core-1.22.1-1.amzn2.0.3.x86_64                                          5/6
  Installing : 1:nginx-1.22.1-1.amzn2.0.3.x86_64                                               6/6
  Verifying  : 1:nginx-1.22.1-1.amzn2.0.3.x86_64                                               1/6
  Verifying  : gperftools-libs-2.6.1-1.amzn2.x86_64                                            2/6
  Verifying  : 1:openssl11-libs-1.1.1g-12.amzn2.0.20.x86_64                                    3/6
  Verifying  : openssl11-pkcs11-0.4.10-6.amzn2.0.1.x86_64                                      4/6
  Verifying  : 1:nginx-filesystem-1.22.1-1.amzn2.0.3.noarch                                    5/6
  Verifying  : 1:nginx-core-1.22.1-1.amzn2.0.3.x86_64                                          6/6

Installed:
  nginx.x86_64 1:1.22.1-1.amzn2.0.3

Dependency Installed:
  gperftools-libs.x86_64 0:2.6.1-1.amzn2      nginx-core.x86_64 1:1.22.1-1.amzn2.0.3      nginx-filesystem.noarch 1:1.22.1-1.amzn2.0.3
  openssl11-libs.x86_64 1:1.1.1g-12.amzn2.0.20 openssl11-pkcs11.x86_64 0:0.4.10-6.amzn2.0.1

Complete!
  2  httpd_modules             available    [ =1.0  =stable ]
  3  memcached1.5              available    \
     [ =1.5.1  =1.5.16  =1.5.17 ]
  9  R3.4                      available    [ =3.4.3  =stable ]
 10  rust1                     available    \
     [ =1.22.1  =1.26.0  =1.26.1  =1.27.2  =1.31.0  =1.38.0
     =stable ]
 18  libreoffice               available    \
     [ =5.0.6.2_15  =5.3.6.1  =stable ]
 19  gimp                      available    [ =2.8.22 ]
 20 *docker=latest             enabled      \
     [ =17.12.1  =18.03.1  =18.06.1  =18.09.9  =stable ]
 21  mate-desktop1.x           available    \
     [ =1.19.0  =1.20.0  =stable ]
 22  GraphicsMagick1.3         available    \
     [ =1.3.29  =1.3.32  =1.3.34  =stable ]
 24  epel                      available    [ =7.11  =stable ]
 25  testing                   available    [ =1.0  =stable ]
 26  ecs                       available    [ =stable ]
 27 *corretto8                 available    \
     [ =1.8.0_192  =1.8.0_202  =1.8.0_212  =1.8.0_222  =1.8.0_232
     =1.8.0_242  =stable ]
 32  lustre2.10                available    \
     [ =2.10.5  =2.10.8  =stable ]
 33 *java-openjdk11            available    [ =11  =stable ]
 34  lynis                     available    [ =stable ]
 36  BCC                       available    [ =0.x  =stable ]
 37  mono                      available    [ =5.x  =stable ]
 38  nginx1=latest             enabled      [ =stable ]
                [ =2.10.5  =2.10.8  =stable ]
```

```
 33 *java-openjdk11            available    [ =11  =stable ]
 34  lynis                     available    [ =stable ]
 36  BCC                       available    [ =0.x  =stable ]
 37  mono                      available    [ =5.x  =stable ]
 38  nginx1=latest             enabled      [ =stable ]
 40  mock                      available    [ =stable ]
 43  livepatch                 available    [ =stable ]
 44 *python3.8                 available    [ =stable ]
 45  haproxy2                  available    [ =stable ]
 46  collectd                  available    [ =stable ]
 47  aws-nitro-enclaves-cli    available    [ =stable ]
 48  R4                        available    [ =stable ]
  _  kernel-5.4                available    [ =stable ]
 50  selinux-ng                available    [ =stable ]
 52  tomcat9                   available    [ =stable ]
 53  unbound1.13               available    [ =stable ]
 54 *mariadb10.5               available    [ =stable ]
 55  kernel-5.10=latest        enabled      [ =stable ]
 56  redis6                    available    [ =stable ]
 58 *postgresql12              available    [ =stable ]
 59 *postgresql13              available    [ =stable ]
 60  mock2                     available    [ =stable ]
 61  dnsmasq2.85               available    [ =stable ]
 62  kernel-5.15               available    [ =stable ]
 63 *postgresql14              available    [ =stable ]
 64  firefox                   available    [ =stable ]
 65  lustre                    available    [ =stable ]
 66 *php8.1                    available    [ =stable ]
 67  awscli1                   available    [ =stable ]
 68 *php8.2                    available    [ =stable ]
 69  dnsmasq                   available    [ =stable ]
 70  unbound1.17               available    [ =stable ]
 72  collectd-python3          available    [ =stable ]
* Note on end-of-support. Use 'info' subcommand.
```

```
[ec2-user@ip-10-0-6-50 web-tier]$ cd /etc/nginx
[ec2-user@ip-10-0-6-50 nginx]$ ls
conf.d       fastcgi.conf.default   koi-utf   mime.types.default   scgi_params         uwsgi_params.default
default.d    fastcgi_params         koi-win   nginx.conf           scgi_params.default win-utf
fastcgi.conf fastcgi_params.default mime.types nginx.conf.default  uwsgi_params
```

```
[ec2-user@ip-10-0-6-50 nginx]$ sudo rm nginx.conf
[ec2-user@ip-10-0-6-50 nginx]$ sudo aws s3 cp s3://atef-bucket/nginx.conf .
download: s3://atef-bucket/nginx.conf to ./nginx.conf
```

```
[ec2-user@ip-10-0-6-50 nginx]$ chmod -R 755 /home/ec2-user
[ec2-user@ip-10-0-6-50 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-10-0-6-50 nginx]$ sudo service nginx restart
Redirecting to /bin/systemctl restart nginx.service
```

12-Création de l'APP Load Balencer et de l'auto scaling:

Création de l'image app

Création de Target groupe

Basic configuration

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

`lb-app`

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
Includes only IPv4 addresses.

○ Dualstack
Includes IPv4 and IPv6 addresses.

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. The selected VPC can't be changed after the load balancer is created. To confirm the VPC for your targets, view your target groups.

```
atef-vpc
vpc-0329db115c9b56389
IPv4 VPC CIDR: 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-az6)
Subnet

`subnet-0e2b69a2696bcf2b4`   private-app-subnet-az1 ▾

IPv4 address
Assigned from CIDR 10.0.3.0/24

☑ us-east-1b (use1-az1)
Subnet

`subnet-04c394daad9e2f7f3`   private-app-subnet-az2 ▾

IPv4 address
Assigned from CIDR 10.0.7.0/24

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.

Security groups

`Select up to 5 security groups` ▾

lb-app-sg ✕
sg-0283793124500187f   VPC: vpc-0329db115c9b56389

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** | Info

HTTP ▾ : 80

1-65535

Forward to   app-target-grp   HTTP ▾
             Target type: Instance, IPv4

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

Configuration de Load Balancer interne

Launch template name and description

Launch template name - *required*

app-template

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

Template version description

app-template

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

Launch template contents
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)** 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

○ 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)

image-app
ami-0cc17d73a96cb6d3f
2024-04-04T05:37:30.000Z   Virtualization: hvm   ENA enabled: true   Root device type: ebs

Description
image-app

Architecture   AMI ID
x86_64   ami-0cc17d73a96cb6d3f

▼ **Instance type** Info | Get advice   Advanced

Instance type

t2.micro   Free tier eligible
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

⚪ 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

Don't include in launch template   ↻ 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

app-sg   sg-0a9cd1be3f0fff336 ✕   ↻ Compare security
VPC: vpc-0329db115c9b56389   group rules

▶ Advanced network configuration

Création du launch template

Choose launch template or configuration Info

Specify a launch template that contains settings common to all EC2 instances that are launched by this Auto Scaling group. If you currently use launch configurations, you might consider migrating to launch templates.

Name

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

```
app-auto-scale
```

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

Launch template Info   Switch to launch configuration

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.

```
app-template                                          ▼        ⟳
```

Create a launch template 🗗

Version

```
Default (1)        ▼       ⟳
```

Create a launch template version 🗗

Description	Launch template	Instance type
app-template	app-template 🗗	t2.micro
	lt-0d1d89498219f8c77	

AMI ID	Security groups	Request Spot Instances
ami-0cc17d73a96cb6d3f	-	No

Key pair name	Security group IDs	
-	sg-0a9cd1be3f0fff336 🗗	

Additional details

Storage (volumes)	Date created	
-	Thu Apr 04 2024 06:51:01 GMT+0100 (heure normale d'Afrique de l'Ouest)	

Cancel   **Next**

Choose instance launch options Info

Choose the VPC network environment that your instances are launched into, and customize the instance types and purchase options.

Instance type requirements Info   Override launch template

You can keep the same instance attributes or instance type from your launch template, or you can choose to override the launch template by specifying different instance attributes or manually adding instance types.

Launch template	Version	Description
app-template 🗗	Default	app-template
lt-0d1d89498219f8c77		

Instance type
t2.micro

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-0329db115c9b56389 (atef-vpc)      ▼      ⟳
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-1b | subnet-04c394daad9e2f7f3 (private-   ✕
app-subnet-az2)
10.0.7.0/24
```

```
us-east-1a | subnet-0e2b69a2696bcf2b4 (private-   ✕
app-subnet-az1)
10.0.3.0/24
```

Create a subnet 🗗

Cancel   Skip to review   Previous   **Next**

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 ▾ | C |

app-target-grp | HTTP   ✕
Application Load Balancer: lb-app

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 network access and connectivity with other services.
- ○ **Attach to VPC Lattice service**
  Incoming requests associated with specified VPC Lattice target groups will be routed to your Auto Scaling group.

Create new VPC Lattice service ↗

Health checks
Health checks increase availability by replacing unhealthy instances. When you use multiple health checks, all are evaluated, and if at least one fails, instance replacement occurs.

EC2 health checks
ⓘ Always enabled

Additional health check types – optional | Info
☐ Turn on Elastic Load Balancing health checks [Recommended]
Elastic Load Balancing monitors whether instances are available to handle requests. When it reports an unhealthy instance, EC2 Auto Scaling can replace it on its next periodic check.

☐ Turn on VPC Lattice health checks
VPC Lattice can monitor whether instances are available to handle requests. If it considers a target as failed a health check, EC2 Auto Scaling replaces it after its next periodic check.

Configure group size and scaling – *optional* Info
Define your group's desired capacity and scaling limits. You can optionally add automatic scaling to adjust the size of your group.

Group size Info
Set the initial size of the Auto Scaling group. After creating the group, you can change its size to meet demand, either manually or by using automatic scaling.

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	Max desired capacity
2	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.

Instance maintenance policy 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.

Choose a replacement behavior depending on your availability requirements

[Mixed behavior]	[Prioritize availability]	[Control costs]	[Flexible]
● **No policy** For rebalancing events, new instances will launch before terminating others. For all other events, instances terminate and launch at the same time.	○ **Launch before terminating** Launch new instances and wait for them to be ready before terminating others. This allows you to go above your desired capacity by a given percentage and	○ **Terminate and launch** Terminate and launch instances at the same time. This allows you to go below your desired capacity by a given percentage and may temporarily reduce	○ **Custom behavior** Set custom values for the minimum and maximum amount of available capacity. This gives you greater flexibility in setting how far below and over your desired capacity EC2

Création de l'auto-scaling-grp-app

On suit les mémes étapes pour le load balencer extérieur :

Review the load balancer configurations and make changes if needed. After you finish reviewing the configurations, choose **Create load balancer**.

Summary
Review and confirm your configurations. Estimate cost ⧉

Basic configuration Edit

lb-web

- Internet-facing
- IPv4

Security groups Edit

- lb-web-sg
  sg-093f0f76243aa7f8c ⧉

Network mapping Edit

VPC vpc-0329db115c9b56389 ⧉
atef-vpc

- us-east-1a
  subnet-05d1749cc42502bf8 ⧉
  private-web-subnet-az1
- us-east-1b
  subnet-001f7699a550caec7 ⧉
  private-web-subnet-az2

Listeners and routing Edit

- HTTP:80 defaults to
  web-target-grp ⧉

Service integrations Edit

AWS WAF: *None*
AWS Global Accelerator: *None*

Tags Edit

None

Attributes

ⓘ Certain default attributes will be applied to your load balancer. You can view and edit them after creating the load balancer.

Creation workflow and status

Launch Templates (2) Info   ⟳   Actions ▼   **Create launch template**

🔍 Search   ‹ 1 › ⚙

	Launch Template ID ▽	Launch Template Name ▽	Default Version ▽	Latest Version ▽	Create Time ▽	Create... ▽
○	lt-0c6ff197d7a9b18ab	web-template	1	1	2024-04-04T07:29:45.000Z	arn:aws:s...
○	lt-0d1d89498219f8c77	app-template	1	1	2024-04-04T05:51:01.000Z	arn:aws:s...

EC2 › Auto Scaling groups

Auto Scaling groups (2) Info   ⟳   Launch configurations

🔍 Search your Auto Scaling groups

	Name ▽	Launch template/configuration ⧉ ▽	Instances ▽	Status ▽	Desired capacity ▽	Min ▽	Max ▽	Availability Zones
☐	web-auto-scale	web-template | Version Default	0	⊙ Updating capacity...	2	2	2	us-east-1a, us-east-1b
☐	app-auto-scale	app-template | Version Default	2	-	2	2	2	us-east-1a, us-east-1b

13-Test :

On prend le DNS name du LB externe et on le copie dans une nouvelle fenétre du navigateur :
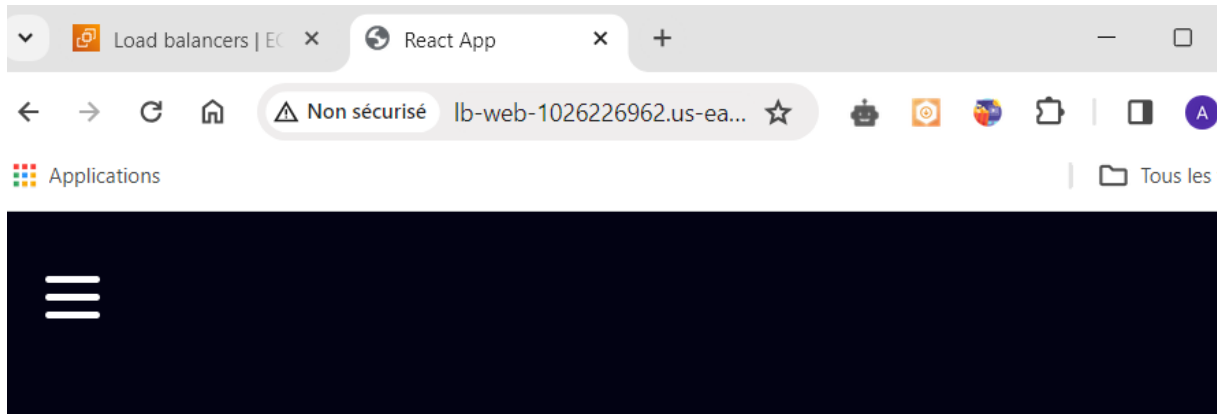
L'application apparait :

AURORA DATABASE DEMO PAGE

DEL
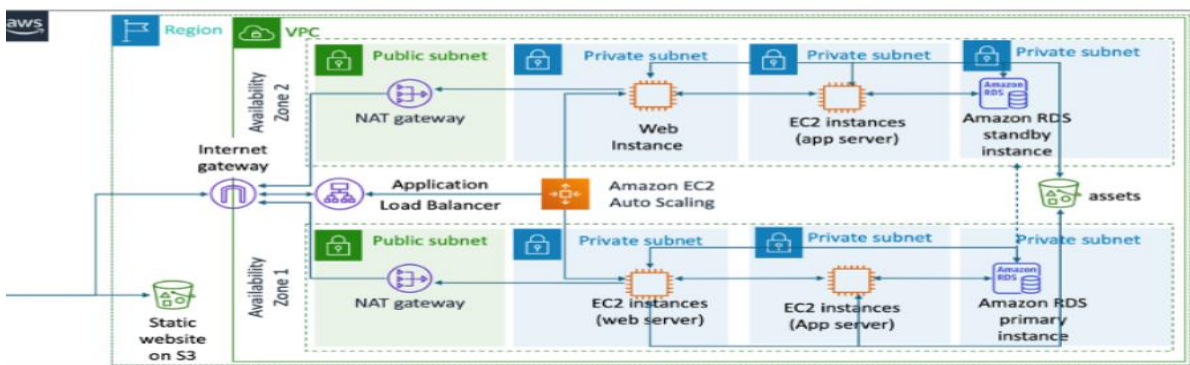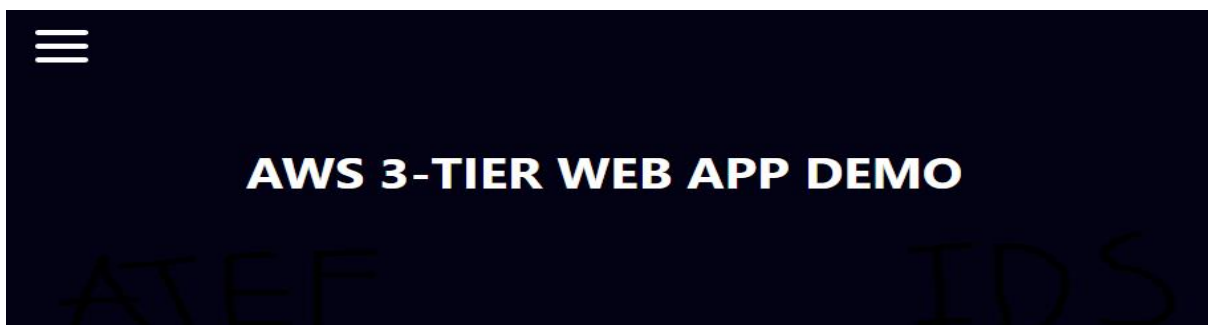
ID	AMOUNT	DESC
ADD		
1	400	groceries

ON ajoute une ligne :

AURORA DATABASE DEMO PAGE

DEL

ID	AMOUNT	DESC
ADD		
1	400	groceries
2	200	karweya

AURORA DATABASE DEMO PAGE

DEL

ID	AMOUNT	DESC
ADD	800	kakaweya
1	400	groceries
2	200	karweya

On reconnecte sur l'app instance et on examine la base de données :

```
[ec2-user@ip-10-0-1-211 ~]$ ssh 10.0.3.108
Last login: Thu Apr  4 08:06:10 2024 from 10.0.1.211

       ,        #_
   ~\_   ####_         Amazon Linux 2
  ~~  \_#####\
  ~~     \###|         AL2 End of Life is 2025-06-30.
  ~~       \#/ ___
   ~~       V~' '->
    ~~~        /        A newer version of Amazon Linux is available!
     ~~._.   _/
       _/ _/           Amazon Linux 2023, GA and supported until 2028-03-15.
     _/m/'                 https://aws.amazon.com/linux/amazon-linux-2023/

[ec2-user@ip-10-0-3-108 ~]$ mysql -h database-1-instance-1.cmahgi5zy9pe.us-east-1.rds.amazonaws.co
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MySQL connection id is 5164
Server version: 5.7.12 MySQL Community Server (GPL)

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)]> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| sys                |
| webappdb           |
+--------------------+
5 rows in set (0.00 sec)

MySQL [(none)]> use webappdb;
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 [webappdb]> show tables;
+--------------------+
| Tables_in_webappdb |
+--------------------+
| transactions       |
+--------------------+
1 row in set (0.00 sec)

MySQL [webappdb]> select * from transactions;
+----+--------+-------------+
| id | amount | description |
+----+--------+-------------+
|  1 | 400.00 | groceries   |
|  2 | 200.00 | karweya     |
|  3 | 800.00 | kakaweya    |
+----+--------+-------------+
3 rows in set (0.01 sec)
```

Yup la base de données a été modifiée