Etudiante : Mariame SANGARE

Classe :M2GL ISI

NB : Etant donné que mon port 8080 est occupé par un agent système, j'ai décidé de prendre un autre port pour mon web 82.

TP3 : Mise en place d'un cluster de 2 nodes

Ce tp consiste à la mise en place d'un cluster avec 2 nodes. Dans cette suite nous allons faire ses différentes étapes :

1. Préparation de l'environnement avec Vagrant

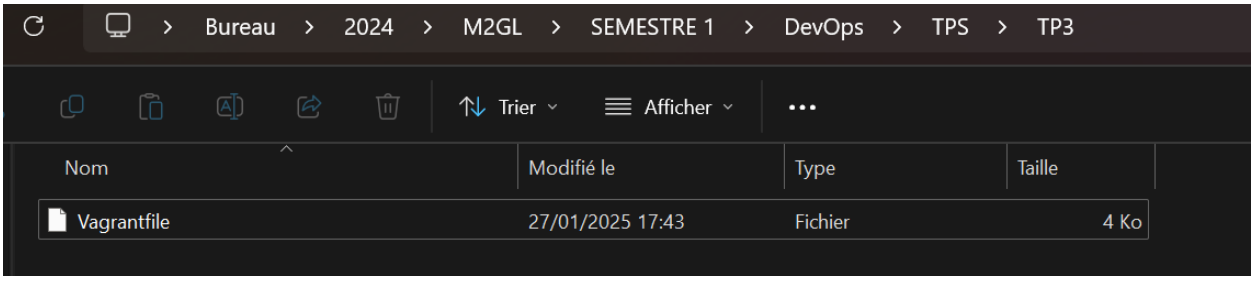
Utiliser un fichier Vagrantfile simplifiera grandement la configuration du cluster. Voici comment procéder :

- Initialiser un Vagrantfile

Tout d'abord on ouvre l'invite de commande puis on se place sur le répertoire où nous allons initialiser notre fichier vagrant ici **TP3** et faire la commande :

```
C:\Users\Mariame\Desktop\2024\M2GL\SEMESTRE 1\DevOps\TPS\TP3>vagrant init
A `Vagrantfile` has been placed in this directory. You are now
ready to `vagrant up` your first virtual environment! Please read
the comments in the Vagrantfile as well as documentation on
`vagrantup.com` for more information on using Vagrant.
```

Une fois initialisée nous aurons un fichier Vagrantfile dans notre dossier TP3



A partir de là nous pouvons configurer nos deux machines :

- Une machine web avec Node.js et Spring Boot.

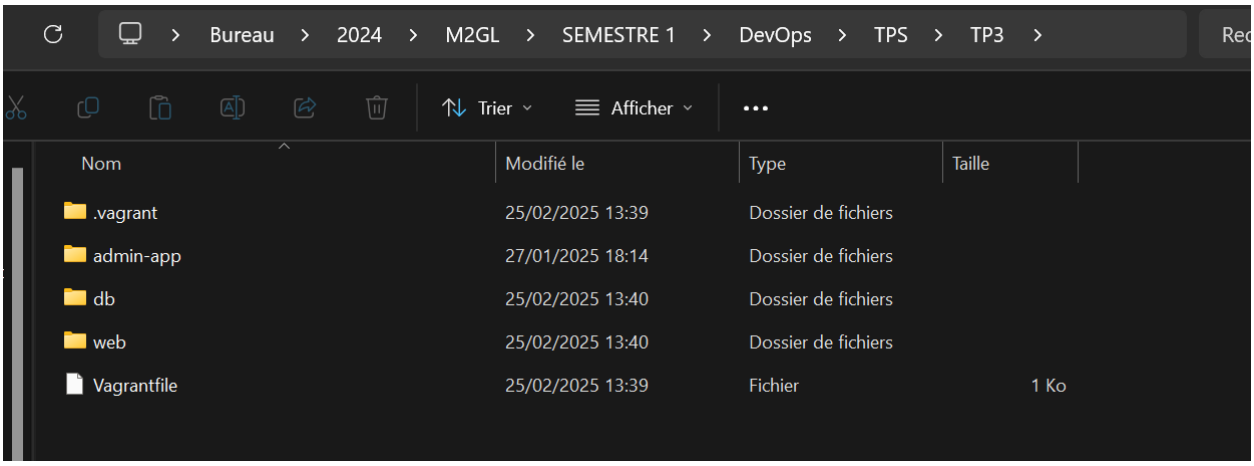
```
  config.vm.define "webserver" do |webserver|
    webserver.vm.box = "bento/ubuntu-22.04"
    webserver.vm.box_check_update = false
    webserver.vm.network "forwarded_port", guest: 82, host: 8086
    webserver.vm.network "private_network", ip: "192.168.33.10"
    webserver.vm.synced_folder "./web", "/var/www/html"
    webserver.vm.provider "virtualbox" do |vb|
      vb.gui = false
      vb.memory = "1024"
      vb.name = "webserver"
    end
  end
end
```

Ce fichier de configuration Vagrant définit une machine virtuelle appelée "webserver" basée sur Ubuntu 22.04. La machine a un port forwardé (port 82 sur la machine virtuelle vers le port 8086 sur l'hôte) et utilise un réseau privé avec l'adresse IP 192.168.33.10. Un dossier local est synchronisé avec "/var/www/html" sur la machine virtuelle. La configuration VirtualBox alloue 1 Go de RAM et 1 CPU à la machine, avec l'interface graphique désactivée.

- Une machine db avec MySQL.

```
Vagrant.configure("2") do |config|
  config.vm.define "dbserver" do |dbserver|
    dbserver.vm.box = "bento/ubuntu-22.04"
    dbserver.vm.box_check_update = false
    dbserver.vm.network "forwarded_port", guest: 84, host: 9096
    dbserver.vm.network "private_network", ip: "192.168.33.11"
    dbserver.vm.synced_folder "./db", "/var/www/html"
    dbserver.vm.provider "virtualbox" do |vb|
      vb.gui = false
      vb.memory = "1024"
      vb.name = "dbserver"
    end
  end
```

- Créer les répertoires web et db



Maintenant on peut valider puis démarrer nos machines avec la commande :

```
vagrant@vagrant:~$ Connection to 127.0.0.1 closed by remote host.
PS C:\Users\Mariame\Desktop\2024\M2GL\SEMESTRE 1\DevOps\TPS\TP3> vagrant up webserver
Bringing machine 'webserver' up with 'virtualbox' provider...
==> webserver: Importing base box 'bento/ubuntu-22.04'...
==> webserver: Matching MAC address for NAT networking...
==> webserver: Setting the name of the VM: webserver
==> webserver: Clearing any previously set network interfaces...
==> webserver: Preparing network interfaces based on configuration...
    webserver: Adapter 1: nat
    webserver: Adapter 2: hostonly
==> webserver: Forwarding ports...
    webserver: 82 (guest) => 8086 (host) (adapter 1)
    webserver: 22 (guest) => 2222 (host) (adapter 1)
==> webserver: Running 'pre-boot' VM customizations...
==> webserver: Booting VM...
==> webserver: Waiting for machine to boot. This may take a few minutes...
    webserver: SSH address: 127.0.0.1:2222
    webserver: SSH username: vagrant
    webserver: SSH auth method: private key
    webserver:
    webserver: Vagrant insecure key detected. Vagrant will automatically replace
    webserver: this with a newly generated keypair for better security.
    webserver:
    webserver: Inserting generated public key within guest...
    webserver: Removing insecure key from the guest if it's present...
    webserver: Key inserted! Disconnecting and reconnecting using new SSH key...
==> webserver: Machine booted and ready!
==> webserver: Checking for guest additions in VM...
    webserver: The guest additions on this VM do not match the installed version of
    webserver: VirtualBox! In most cases this is fine, but in rare cases it can
```

On fait pareil pour dbserver

Nous pourrons accéder à chaque machine avec :

```
PS C:\Users\Mariame\Desktop\2024\M2GL\SEMESTRE 1\DevOps\TPS\TP3> vagrant ssh webserver
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 5.15.0-133-generic x86_64)

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

 System information as of Tue Feb 25 01:55:15 PM UTC 2025

  System load:  0.83               Processes:             156
  Usage of /:   15.1% of 30.34GB   Users logged in:       0
  Memory usage: 21%                IPv4 address for eth0: 10.0.2.15
  Swap usage:   0%


This system is built by the Bento project by Chef Software
More information can be found at https://github.com/chef/bento

Use of this system is acceptance of the OS vendor EULA and License Agreements.
vagrant@vagrant:~$
```

```
PS C:\Users\Mariame\Desktop\2024\M2GL\SEMESTRE 1\DevOps\TPS\TP3> vagrant ssh webserver
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 5.15.0-133-generic x86_64)

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

 System information as of Tue Feb 25 02:19:26 PM UTC 2025

  System load:  0.3                Processes:             156
  Usage of /:   15.8% of 30.34GB   Users logged in:       0
  Memory usage: 23%                IPv4 address for eth0: 10.0.2.15
  Swap usage:   0%


This system is built by the Bento project by Chef Software
More information can be found at https://github.com/chef/bento

Use of this system is acceptance of the OS vendor EULA and License Agreements.
Last login: Tue Feb 25 13:55:16 2025 from 10.0.2.2
vagrant@vagrant:~$
```

2. Déploiement du projet Spring Boot

Nous allons tout d'abord cloner le projet

```
vagrant@ubuntu-bionic:~$ git clone https://github.com/ngorseck/admin-app
Cloning into 'admin-app'...
remote: Enumerating objects: 237, done.
remote: Counting objects: 100% (237/237), done.
remote: Compressing objects: 100% (164/164), done.
remote: Total 237 (delta 100), reused 188 (delta 53), pack-reused 0 (from 0)
Receiving objects: 100% (237/237), 893.95 KiB | 525.00 KiB/s, done.
Resolving deltas: 100% (100/100), done.
vagrant@ubuntu-bionic:~$ ls
admin-app  npm-debug.log
vagrant@ubuntu-bionic:~$ cd admin-app
vagrant@ubuntu-bionic:~/admin-app$
```

3. Configuration de la machine db

On va installer mysql dans la machine dbserver puis vérifier le statut de notre serveur mysql

```
root@vagrant:/home/vagrant# apt-cache policy  mysql-server
mysql-server:
  Installed: 8.0.41-0ubuntu0.22.04.1
  Candidate: 8.0.41-0ubuntu0.22.04.1
  Version table:
 *** 8.0.41-0ubuntu0.22.04.1 500
        500 http://us.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages
        500 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages
        100 /var/lib/dpkg/status
     8.0.28-0ubuntu4 500
        500 http://us.archive.ubuntu.com/ubuntu jammy/main amd64 Packages
root@vagrant:/home/vagrant#
```

```
vagrant@vagrant:~$ sudo systemctl status mysql
● mysql.service - MySQL Community Server
     Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: enabled)
     Active: active (running) since Wed 2025-02-26 13:06:30 UTC; 29min ago
    Process: 3021 ExecStartPre=/usr/share/mysql/mysql-systemd-start pre (code=exited, status=0/SUCCESS)
   Main PID: 3029 (mysqld)
     Status: "Server is operational"
      Tasks: 38 (limit: 1015)
     Memory: 368.2M
        CPU: 53.048s
     CGroup: /system.slice/mysql.service
             └─3029 /usr/sbin/mysqld

Feb 26 13:06:25 vagrant systemd[1]: Starting MySQL Community Server...
Feb 26 13:06:30 vagrant systemd[1]: Started MySQL Community Server.
vagrant@vagrant:~$
```

Une fois l'installation et le démarrage vérifiée, nous nous connectons à notre serveur mysql

```
vagrant@vagrant:~$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 11
Server version: 8.0.41-0ubuntu0.22.04.1 (Ubuntu)

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

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

mysql>
```

Puis nous créons un utilisateur qui aura accès à l'addresse ip de notre machine web avec l'addresse ip 192.168.33.10 avec le mot de passe '**M@rivme5758'** et lui donner tous les privilèges.

```
mysql> create user 'myuser'@'192.168.33.10' IDENTIFIED BY 'M@rivme5758';
Query OK, 0 rows affected (0.02 sec)

mysql>
```

```
mysql> grant all privileges ON adminappdb.*  to myuser@'192.168.33.10';
Query OK, 0 rows affected (0.02 sec)

mysql> flush privileges;
Query OK, 0 rows affected (0.01 sec)

mysql>
```

Pour vérifier que notre utilisateur a été créé avec notre addresse ip on fait la commande ci-dessous :

```
mysql> SELECT user, host FROM mysql.user;
+------------------+---------------+
| user             | host          |
+------------------+---------------+
| myuser           | 192.168.33.10 |
| debian-sys-maint | localhost     |
| mysql.infoschema | localhost     |
| mysql.session    | localhost     |
| mysql.sys        | localhost     |
| root             | localhost     |
+------------------+---------------+
6 rows in set (0.01 sec)

mysql>
```

Dans cette image ci-dessous on voit que la connexion à la machine webserver marche

```
Bye
vagrant@vagrant:~$ ping 192.168.33.10
PING 192.168.33.10 (192.168.33.10) 56(84) bytes of data.
64 bytes from 192.168.33.10: icmp_seq=1 ttl=64 time=11.9 ms
64 bytes from 192.168.33.10: icmp_seq=2 ttl=64 time=1.13 ms
64 bytes from 192.168.33.10: icmp_seq=3 ttl=64 time=1.18 ms
64 bytes from 192.168.33.10: icmp_seq=4 ttl=64 time=1.89 ms
64 bytes from 192.168.33.10: icmp_seq=5 ttl=64 time=1.21 ms
64 bytes from 192.168.33.10: icmp_seq=6 ttl=64 time=1.39 ms
64 bytes from 192.168.33.10: icmp_seq=7 ttl=64 time=1.12 ms
```

Creation de la base de données adminapp-db

```
mysql> CREATE DATABASE `adminapp-db`;
Query OK, 1 row affected (0.04 sec)

mysql>
```

Après création de l'utilisateur myuser et de notre base de données on modifie le fichier application.yml en mettant les informations liées à notre serveur web.

```
server:
  port: 8080

spring:
  datasource:
    url: jdbc:mysql://${DB_HOST:localhost}:3306/${DB_NAME:adminapp-db}?createDatabaseIfNotExist=true&useUnicode=true&
    username: ${DB_USERNAME:myuser}
    password: ${DB_PASSWORD:M@rivme5758}
    driverClassName: com.mysql.cj.jdbc.Driver
    #Pour aws, nous navons pas besoin de driver
#    url: jdbc:mysql://database-mysql1.cv3dshuqxbdr.us-east-1.rds.amazonaws.com:3306/db_test?createDatabaseIfNotExist
#    username: admin
#    password: hlKQUq[#R{XW+wh)Ji!xs8Vs:XO[
#    url: jdbc:mysql://adminapp-db.cv3dshuqxbdr.us-east-1.rds.amazonaws.com:3306/adminappdb
#    username: admin
#    password: SamanecorporationPasser123!
  application:
    name: admin-app
#SamanecorporationPasser123!
  jpa:
    hibernate:
      ddl-auto: update
    show-sql: true
    properties:
      hibernate:
        format_sql: true
```

On sauvegarde le fichier et tapons cette commande pour nettoyer et installer les paquets tout en ignorant les tests pour éviter que ça nous génère des erreurs

```
vagrant@vagrant:~/admin-app$ mvn clean install -DskipTests
[INFO] Scanning for projects...
Downloading from central: https://repo.maven.apache.org/maven2/org/springframework/boot/spring-boot-starter-parent/3.1.
/spring-boot-starter-parent-3.1.2.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/springframework/boot/spring-boot-starter-parent/3.1.2
spring-boot-starter-parent-3.1.2.pom (13 kB at 7.4 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/springframework/boot/spring-boot-dependencies/3.1.2/
pring-boot-dependencies-3.1.2.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/springframework/boot/spring-boot-dependencies/3.1.2/s
ring-boot-dependencies-3.1.2.pom (94 kB at 236 kB/s)
```

Et Bim !!!! Build success

```
 (2.6 MB at 490 kB/s)
[INFO] Replacing main artifact /home/vagrant/admin-app/target/admin-app.jar with repackaged archive, adding nest
dencies in BOOT-INF/.
[INFO] The original artifact has been renamed to /home/vagrant/admin-app/target/admin-app.jar.original
[INFO]
[INFO] --- maven-install-plugin:3.1.1:install (default-install) @ admin-app ---
[INFO] Installing /home/vagrant/admin-app/pom.xml to /home/vagrant/.m2/repository/sn/isi/admin-app/0.0.1-SNAPSHO
app-0.0.1-SNAPSHOT.pom
[INFO] Installing /home/vagrant/admin-app/target/admin-app.jar to /home/vagrant/.m2/repository/sn/isi/admin-app/
APSHOT/admin-app-0.0.1-SNAPSHOT.jar
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  01:01 min
[INFO] Finished at: 2025-02-26T13:47:55Z
[INFO] ------------------------------------------------------------------------
vagrant@vagrant:~/admin-app$
```

```
vagrant@vagrant:~/admin-app/target$ ls
admin-app.jar           classes           generated-test-sources  maven-status
admin-app.jar.original  generated-sources  maven-archiver          test-classes
vagrant@vagrant:~/admin-app/target$
```

On compile le fichier jar puis le démarrons

```
vagrant@vagrant:~/admin-app$ java -jar target/admin-app.jar


  .   ____          _            __ _ _
 /\\ / ___'_ __ _ _(_)_ __  __ _ \ \ \ \
( ( )\___ | '_ | '_| | '_ \/ _` | \ \ \ \
 \\/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_\__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::                (v3.1.2)
```

```
vagrant@vagrant:~/admin-app$ mvn spring-boot:run
[INFO] Scanning for projects...
[WARNING]
[WARNING] Some problems were encountered while building the effective model for sn.isi:admin-app:jar:0.0.1-SNAPSHOT
[WARNING] 'dependencies.dependency.(groupId:artifactId:type:classifier)' must be unique: org.springframework.boot:spring-boot-starter
-aop:jar -> duplicate declaration of version (?) @ line 37, column 15
[WARNING]
[WARNING] It is highly recommended to fix these problems because they threaten the stability of your build.
[WARNING]
[WARNING] For this reason, future Maven versions might no longer support building such malformed projects.
[WARNING]
[INFO]
[INFO] ------------------------< sn.isi:admin-app >------------------------
[INFO] Building admin-app 0.0.1-SNAPSHOT
[INFO] --------------------------------[ jar ]---------------------------------
[INFO]
[INFO] >>> spring-boot-maven-plugin:3.1.2:run (default-cli) > test-compile @ admin-app >>>
[INFO]
```