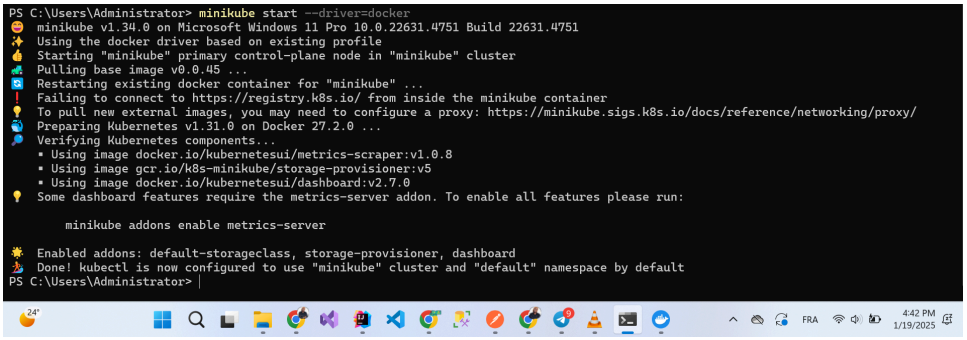
# Processus : Intégration Kubernetes avec Helm et GitLab

Ce document décrit les étapes nécessaires pour configurer Minikube, Helm et GitLab CI/CD pour le déploiement d'applications dans un cluster Kubernetes. Les captures d'écran sont incluses pour chaque étape afin d'illustrer le processus.

## 1. Configuration de Minikube

Dans cette étape, Minikube est configuré pour démarrer avec le driver Docker. La commande utilisée et le résultat sont visibles ci-dessous :

Commande utilisée : `minikube start --driver=docker`

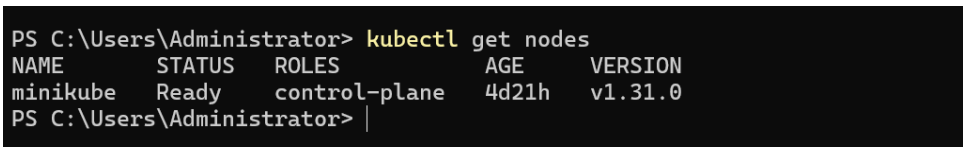



## 2. Vérification de l'état de Minikube

Après avoir démarré Minikube, nous vérifions son état pour confirmer que le contrôle plane et les composants associés sont opérationnels. Voici les commandes et résultats :

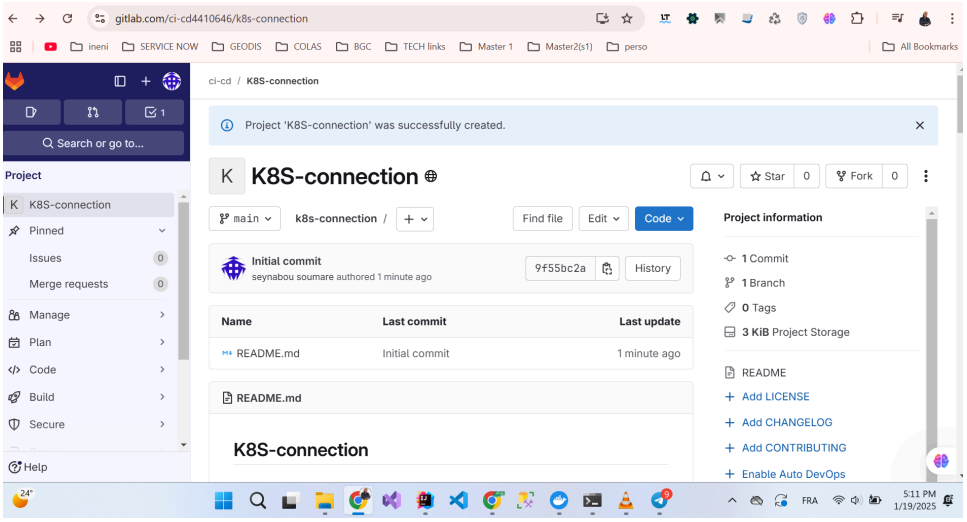
Commande utilisée : `minikube status`


Commande utilisée : `kubectl get nodes`

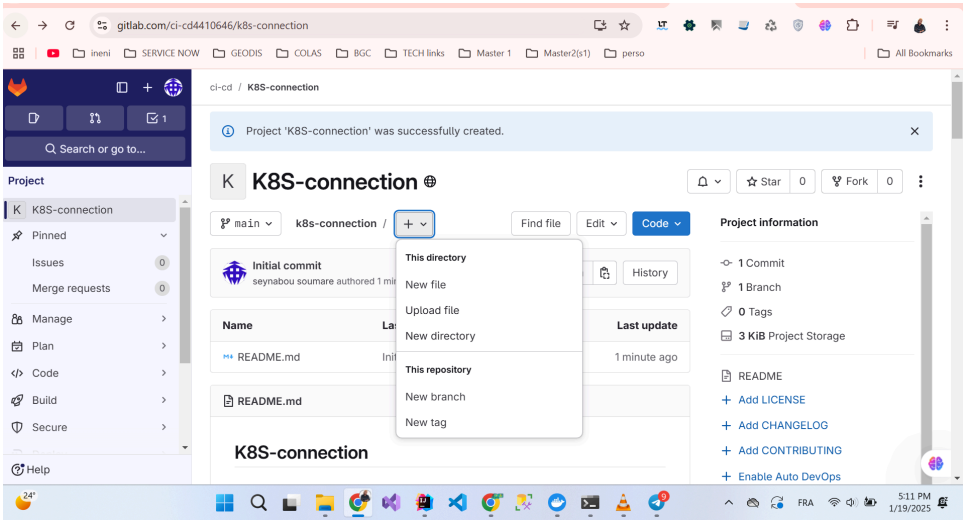


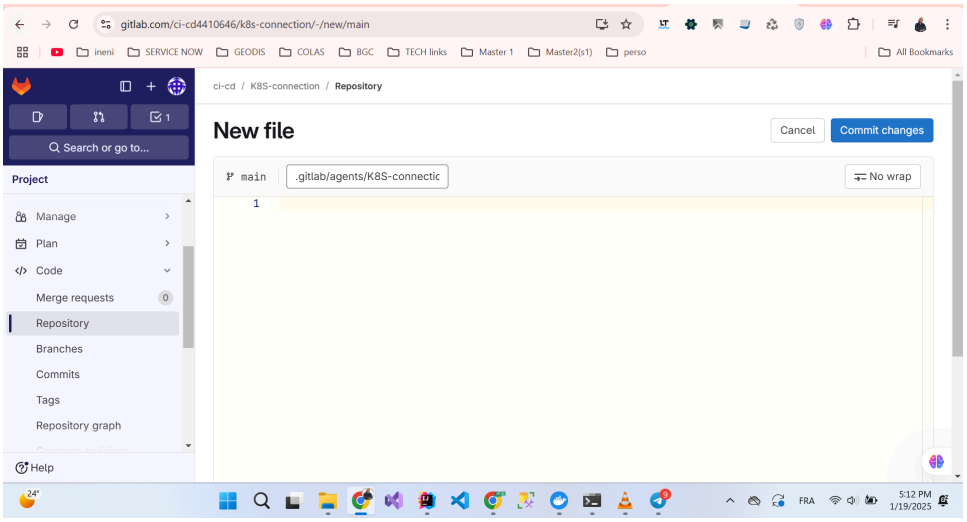

## 3. Intégration avec GitLab

Pour intégrer Kubernetes avec GitLab, un nouveau projet est créé sur GitLab. Un agent GitLab est configuré pour connecter le cluster Kubernetes. Voici les étapes :




Un fichier de configuration YAML est ajouté au projet GitLab pour lier l'agent Kubernetes au cluster.






## 4. Déploiement avec Helm

Helm est utilisé pour gérer les configurations et déployer les applications sur le cluster Kubernetes. Voici les commandes exécutées pour ajouter le repo Helm et déployer l'agent GitLab.

Commande Helm utilisée pour installer un agent GitLab sur Kubernetes, configurant un token

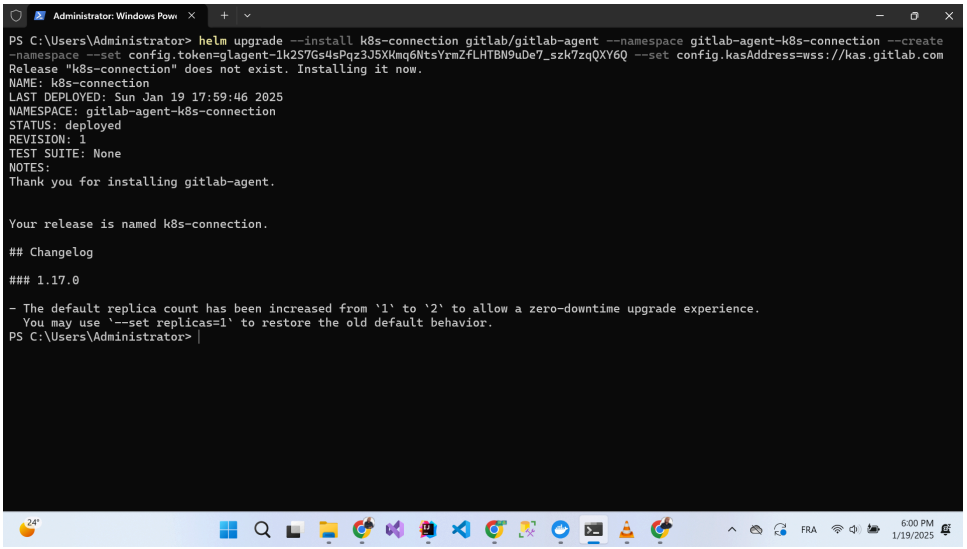
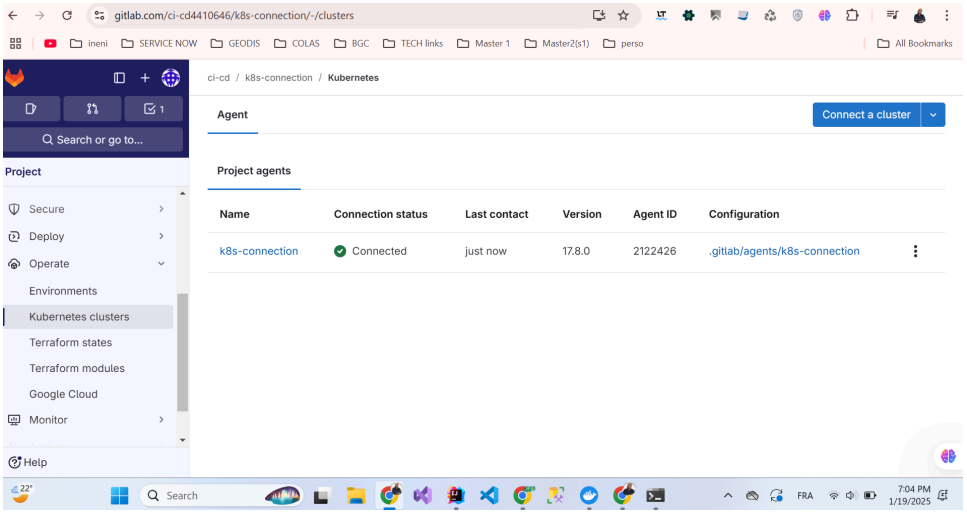
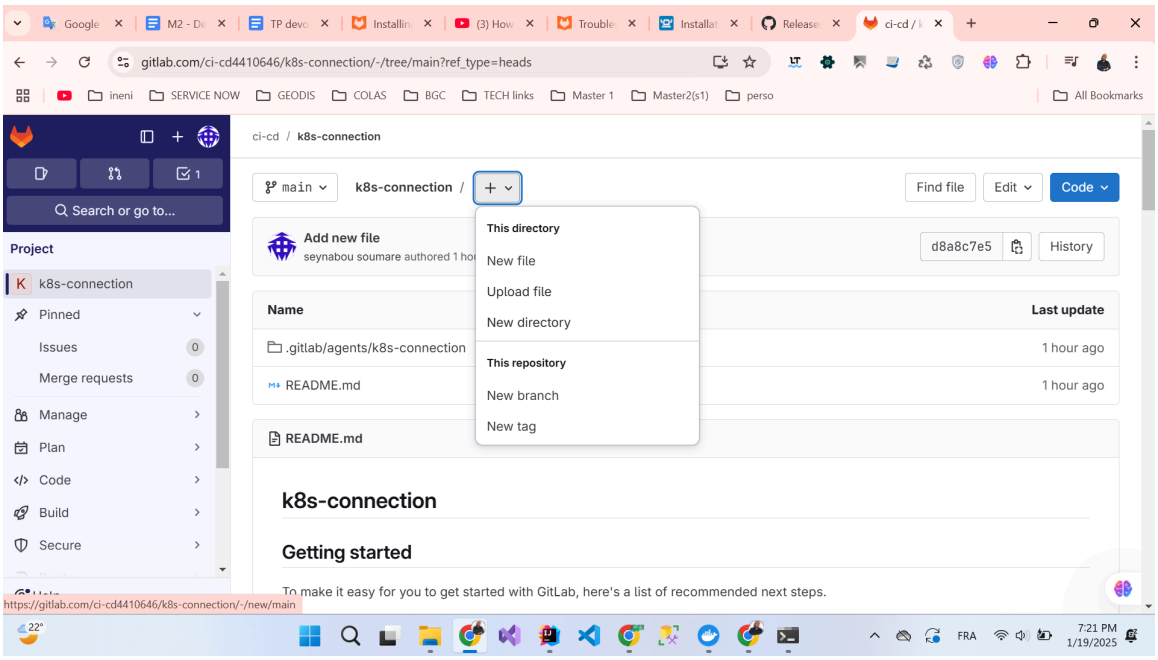


Tableau de bord GitLab montrant un agent Kubernetes connecté avec son statut en ligne et ses informations.

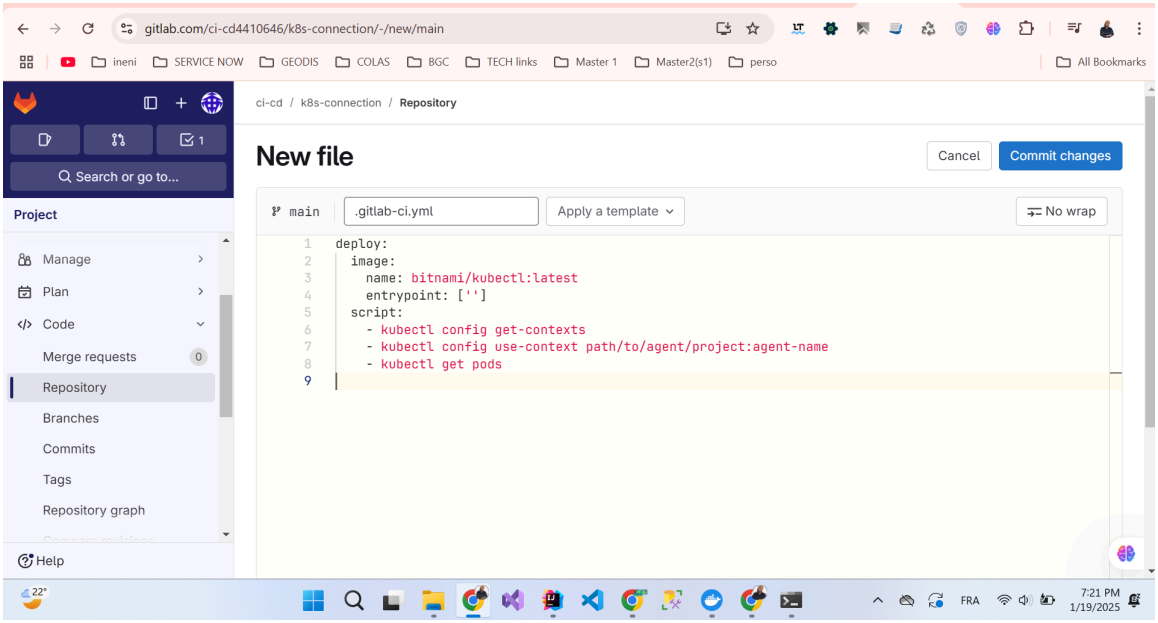



## 6. Test connection entre Gitlab et K8S

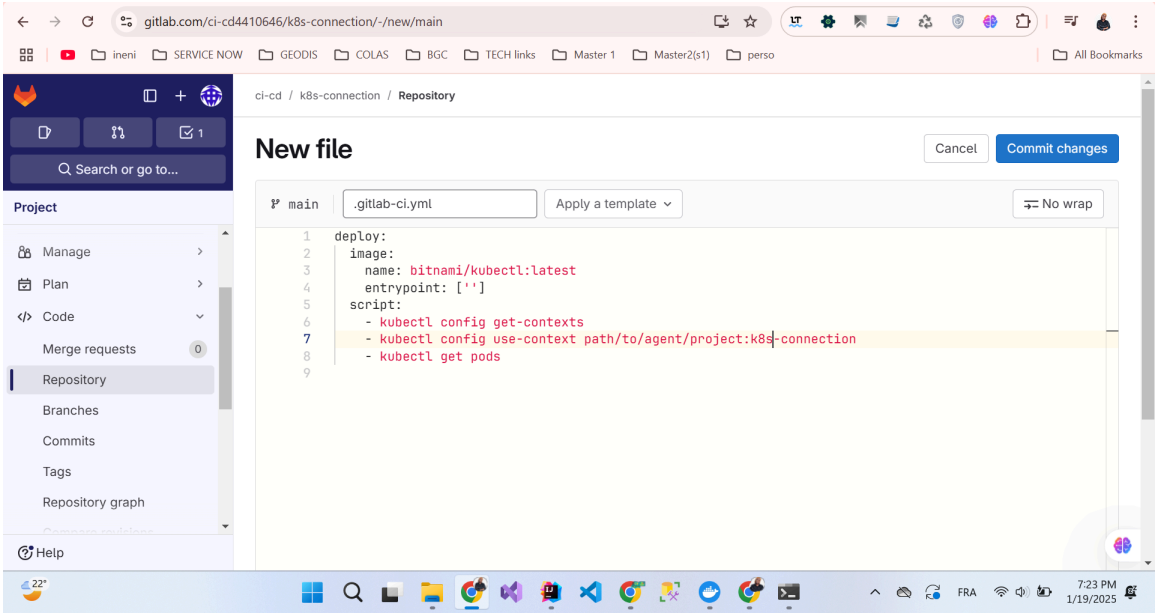
Création d'un nouveau fichier dans le dépôt GitLab pour configurer les interactions avec Kubernetes.



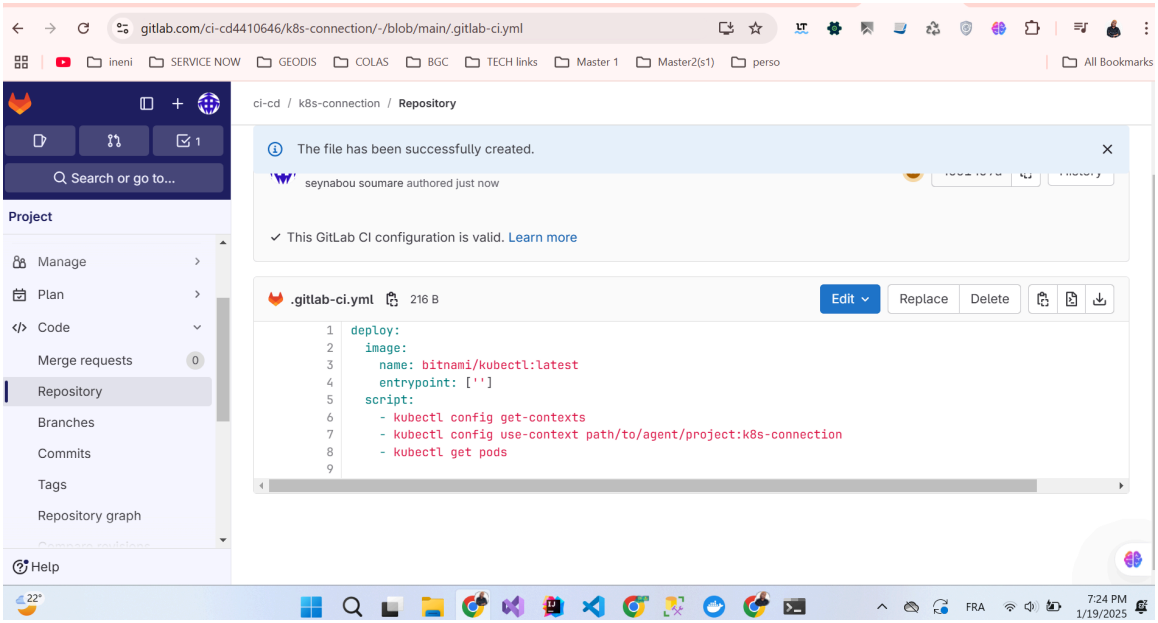
Début de l'édition du fichier `.gitlab-ci.yml` pour définir les étapes du pipeline CI/CD.



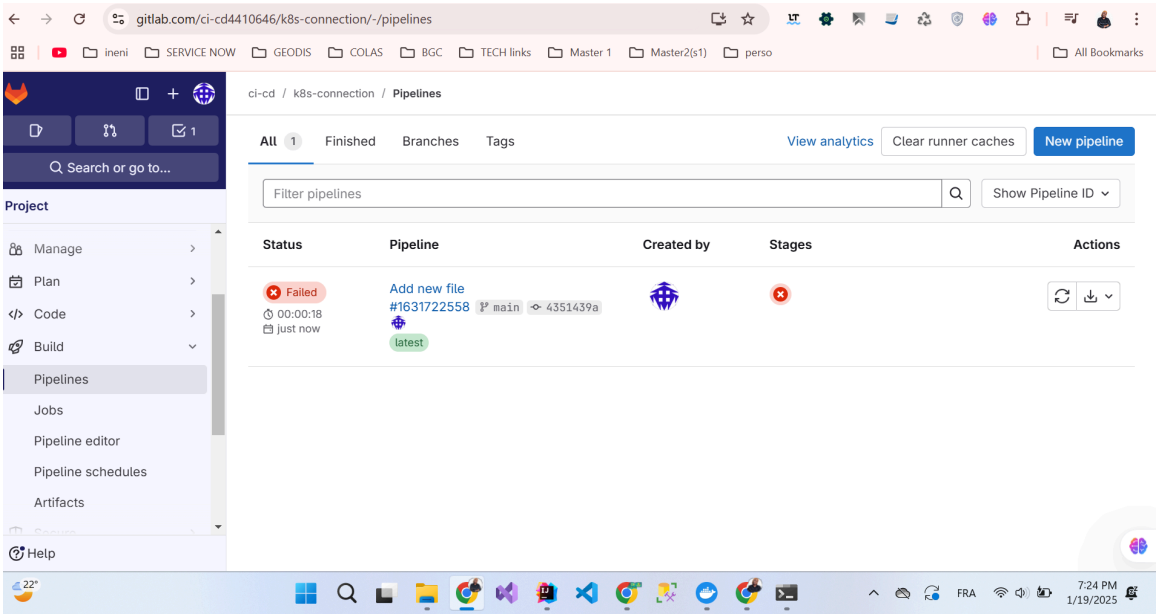

Mise à jour du fichier `.gitlab-ci.yml` pour inclure une configuration d'image Docker et des commandes `kubectl`.



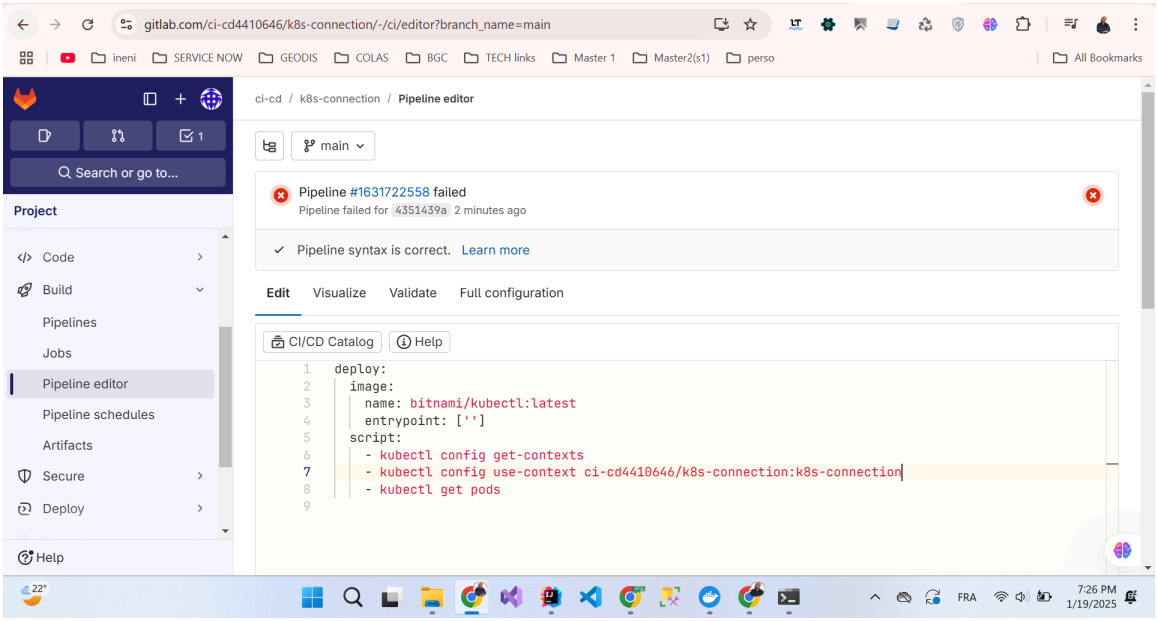
Vue de la configuration validée du fichier `.gitlab-ci.yml` dans le tableau de bord GitLab.



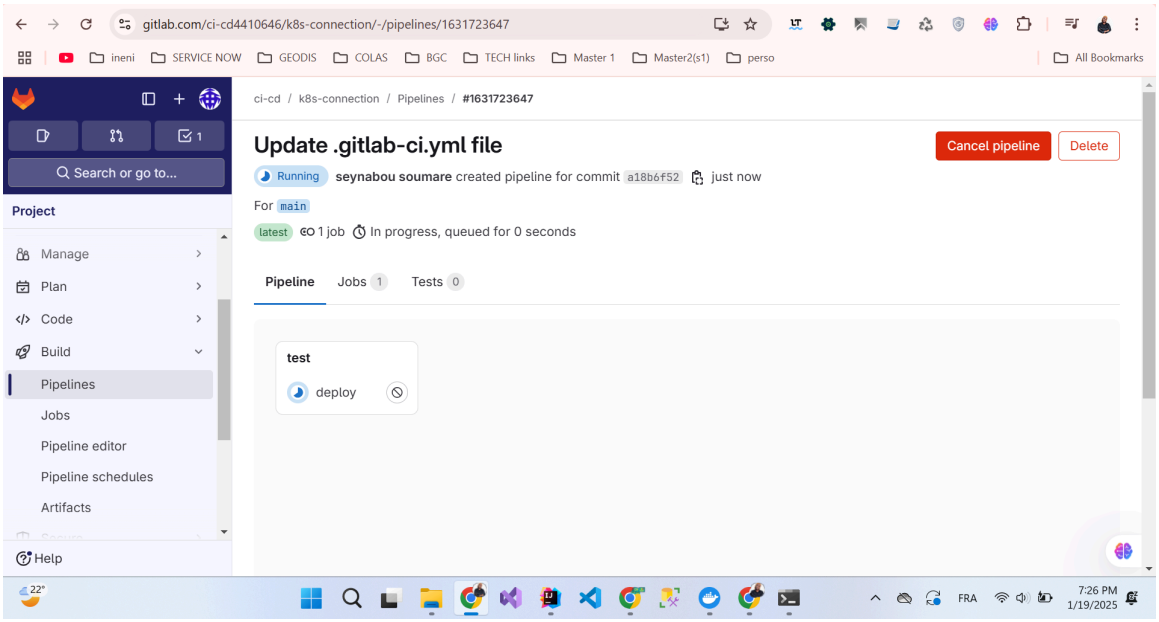

Pipeline CI/CD échoué après une tentative de déploiement à partir du fichier `.gitlab-ci.yml`.



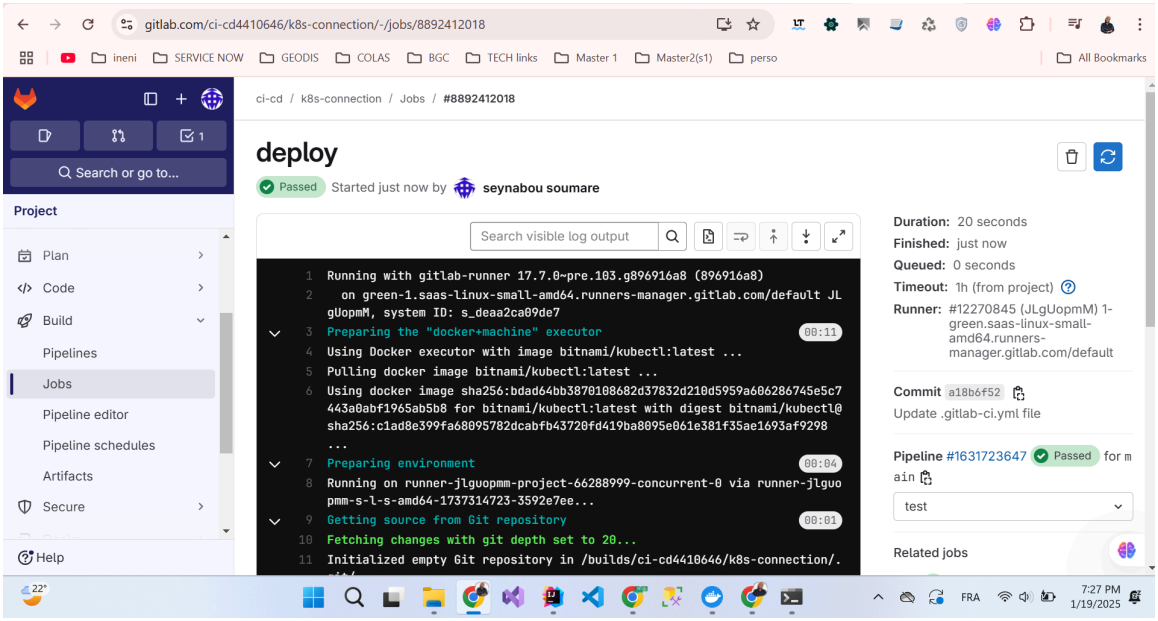
Correction de la configuration dans le fichier `.gitlab-ci.yml` pour ajuster les chemins de contexte Kubernetes.



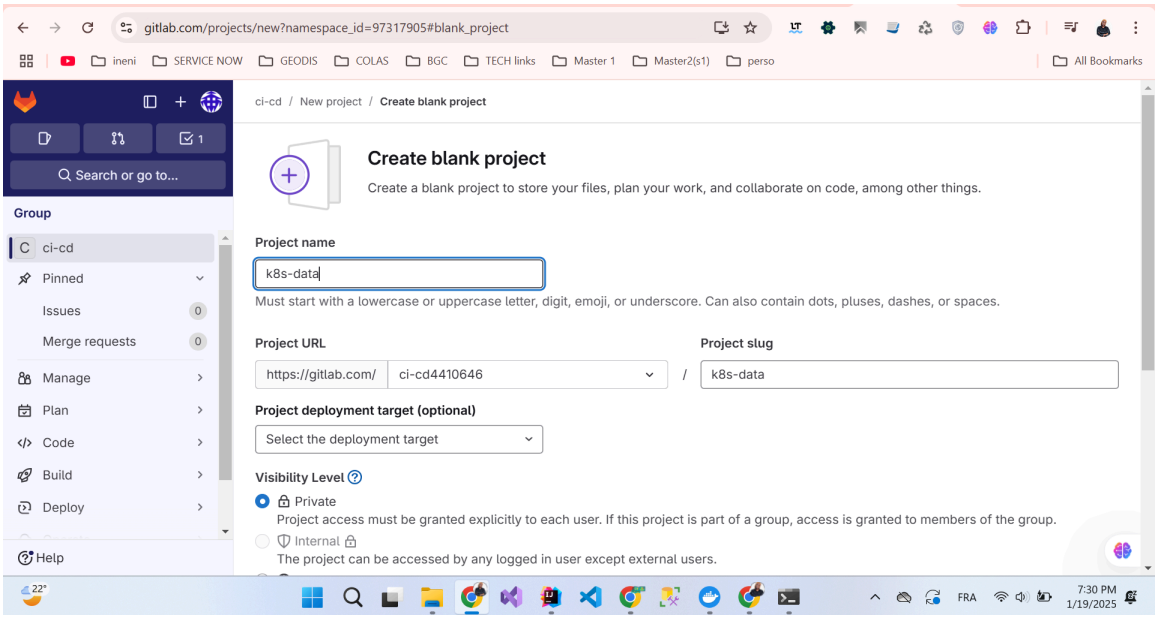

Relancement du pipeline CI/CD, montrant une exécution réussie des étapes configurées.



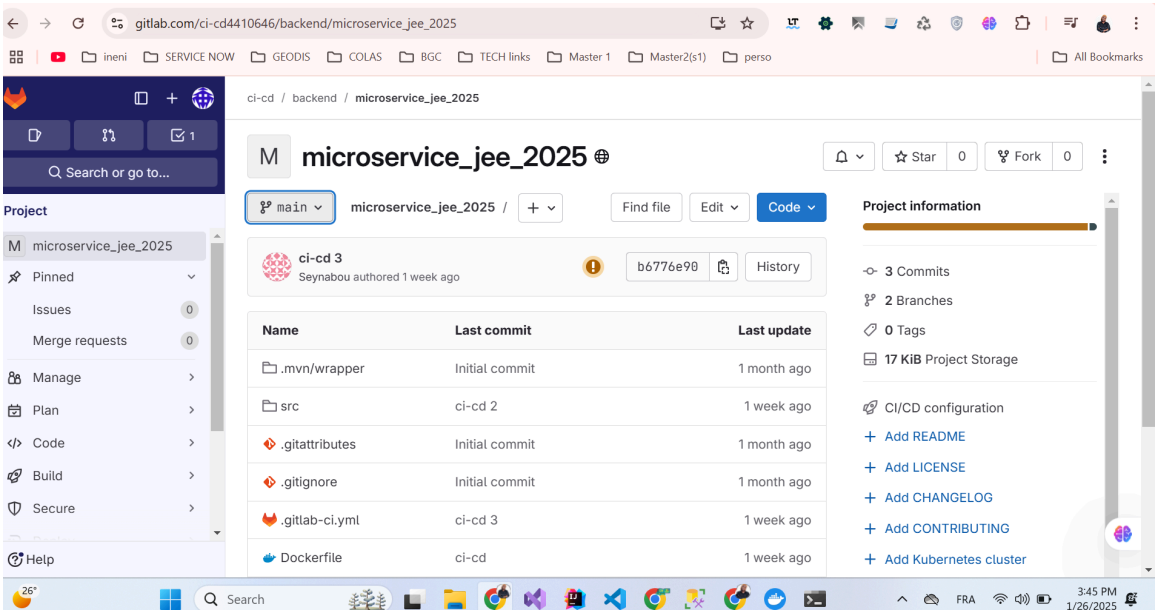
Le job `deploy` utilise un GitLab Runner avec Docker pour exécuter des commandes `kubectl`. Le pipeline est terminé avec succès.

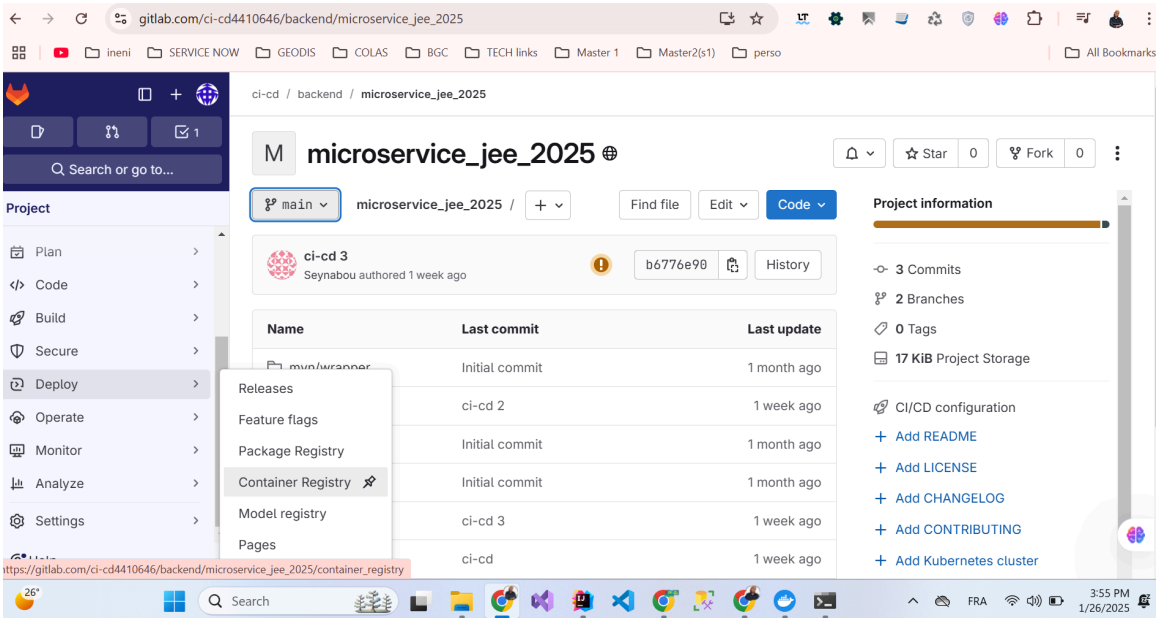


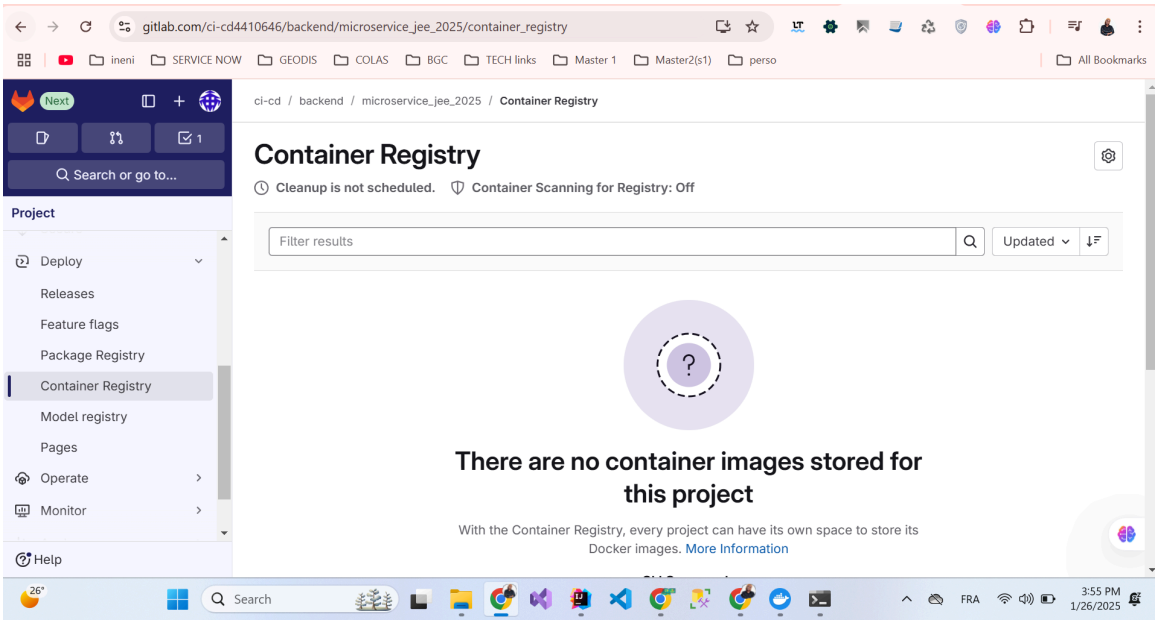

Un projet GitLab nommé `k8s-data` est créé avec une visibilité privée.

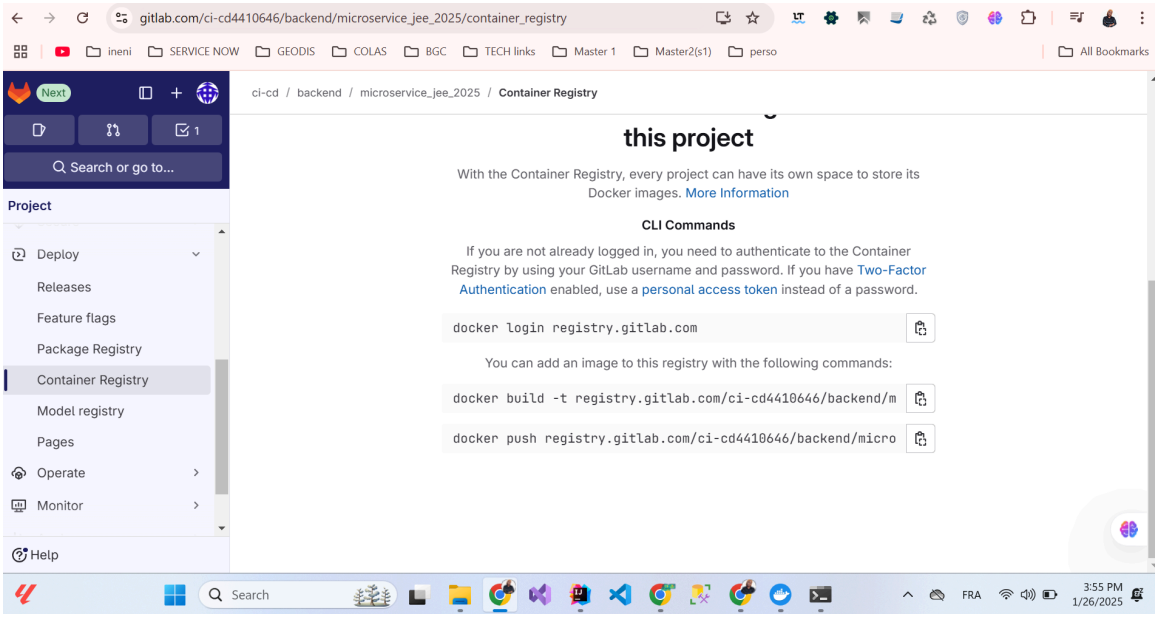


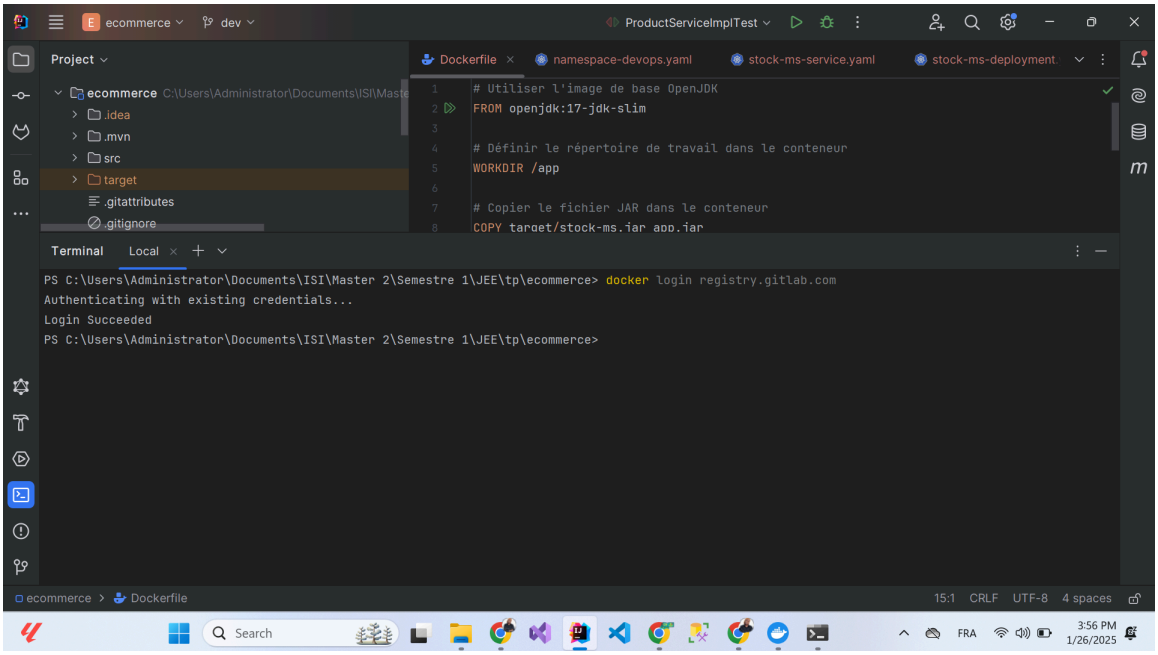
Le projet `stock-ms` a un commit initial et une branche `main`.

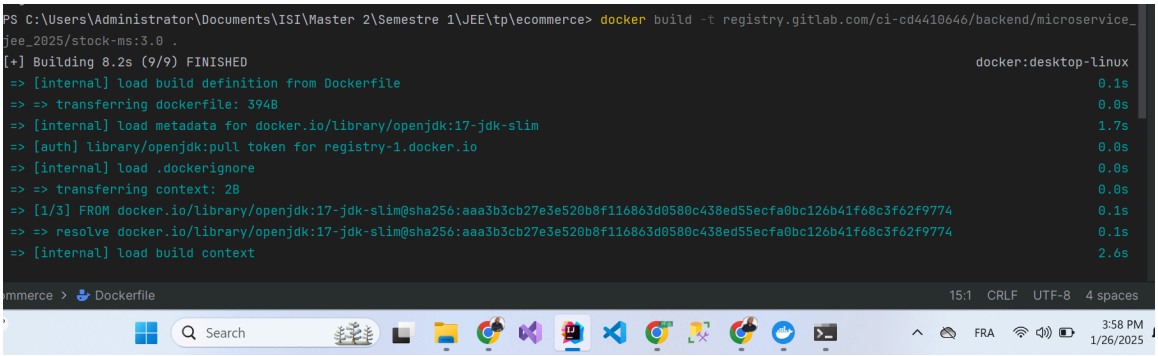


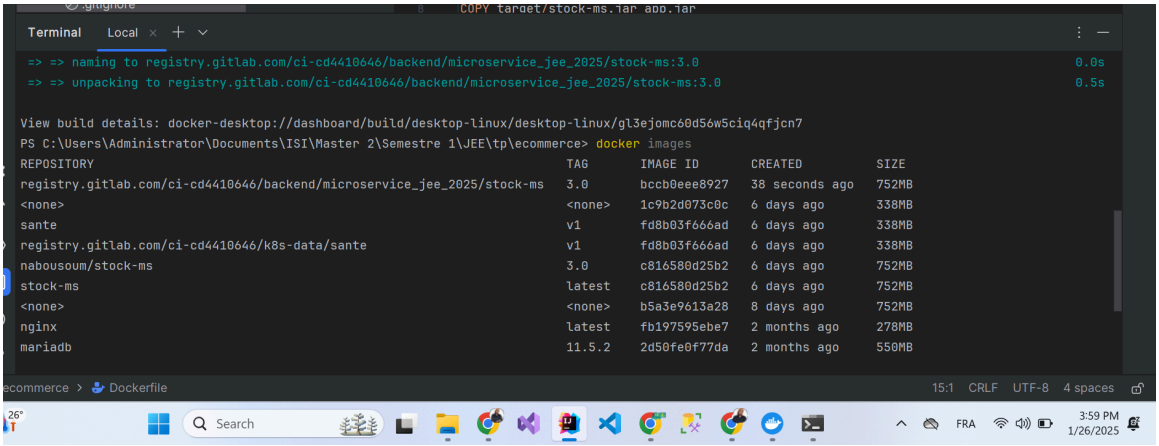



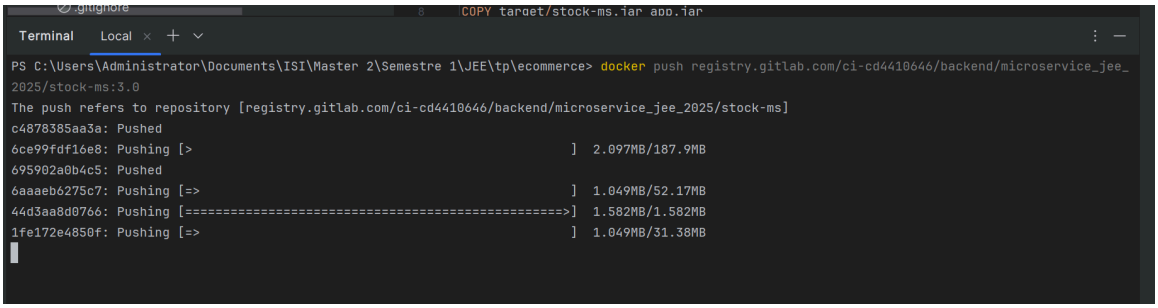

gitlab.com/ci-cd4410646/backend/microservice_jee_2025/container_registry
Next
Search or go to...
Project
Deploy
Releases
Feature flags
Package Registry
Container Registry
Model registry
Pages
Operate
Monitor
Help
ci-cd / backend / microservice_jee_2025 / Container Registry
Container Registry
Cleanup is not scheduled.
Container Scanning for Registry: Off
Filter results
Updated
There are no container images stored for this project
With the Container Registry, every project can have its own space to store its Docker images. More Information
Search
FRA
3:55 PM
1/26/2025

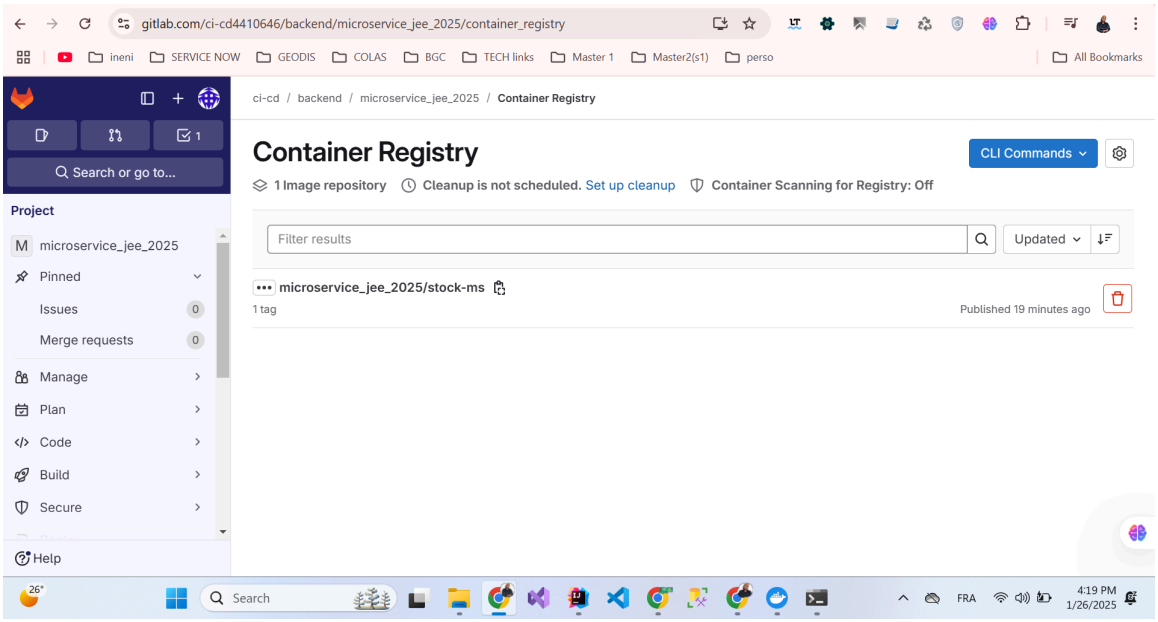

gitlab.com/ci-cd4410646/backend/microservice_jee_2025/container_registry
Next
Search or go to...
Project
Deploy
Releases
Feature flags
Package Registry
Container Registry
Model registry
Pages
Operate
Monitor
Help
ci-cd / backend / microservice_jee_2025 / Container Registry
this project
With the Container Registry, every project can have its own space to store its Docker images. More Information
CLI Commands
If you are not already logged in, you need to authenticate to the Container Registry by using your GitLab username and password. If you have Two-Factor Authentication enabled, use a personal access token instead of a password.
docker login registry.gitlab.com
You can add an image to this registry with the following commands:
docker build -t registry.gitlab.com/ci-cd4410646/backend/m
docker push registry.gitlab.com/ci-cd4410646/backend/micro
Search
FRA
3:55 PM
1/26/2025

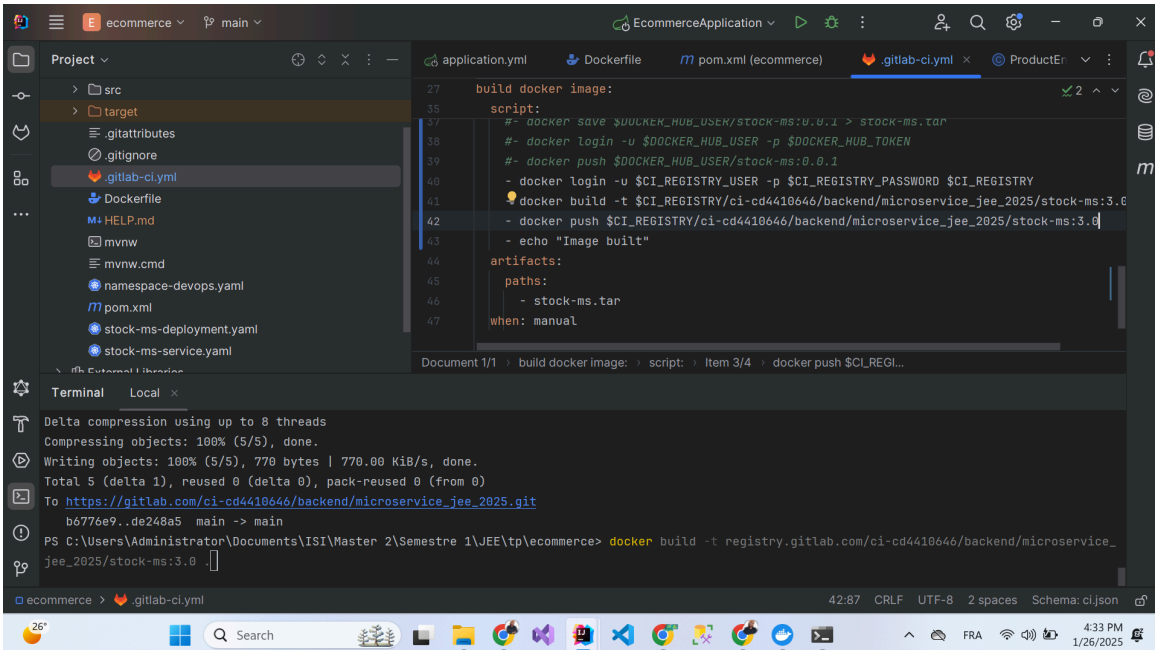

ecommerce
dev
ProductServiceImplTest
Project
Dockerfile
namespace-devops.yaml
stock-ms-service.yaml
stock-ms-deployment
ecommerce C:\Users\Administrator\Documents\ISI\Maste
.idea
.mvn
src
target
.gitattributes
.gitignore
# Utiliser l'image de base OpenJDK
FROM openjdk:17-jdk-slim
# Définir le répertoire de travail dans le conteneur
WORKDIR /app
# Copier le fichier JAR dans le conteneur
COPY target/stock-ms.jar app.jar
Terminal
Local
PS C:\Users\Administrator\Documents\ISI\Master 2\Semestre 1\JEE\tp\ecommerce> docker login registry.gitlab.com
Authenticating with existing credentials...
Login Succeeded
PS C:\Users\Administrator\Documents\ISI\Master 2\Semestre 1\JEE\tp\ecommerce>
ecommerce > Dockerfile
15:1 CRLF UTF-8 4 spaces
Search
FRA
3:56 PM
1/26/2025

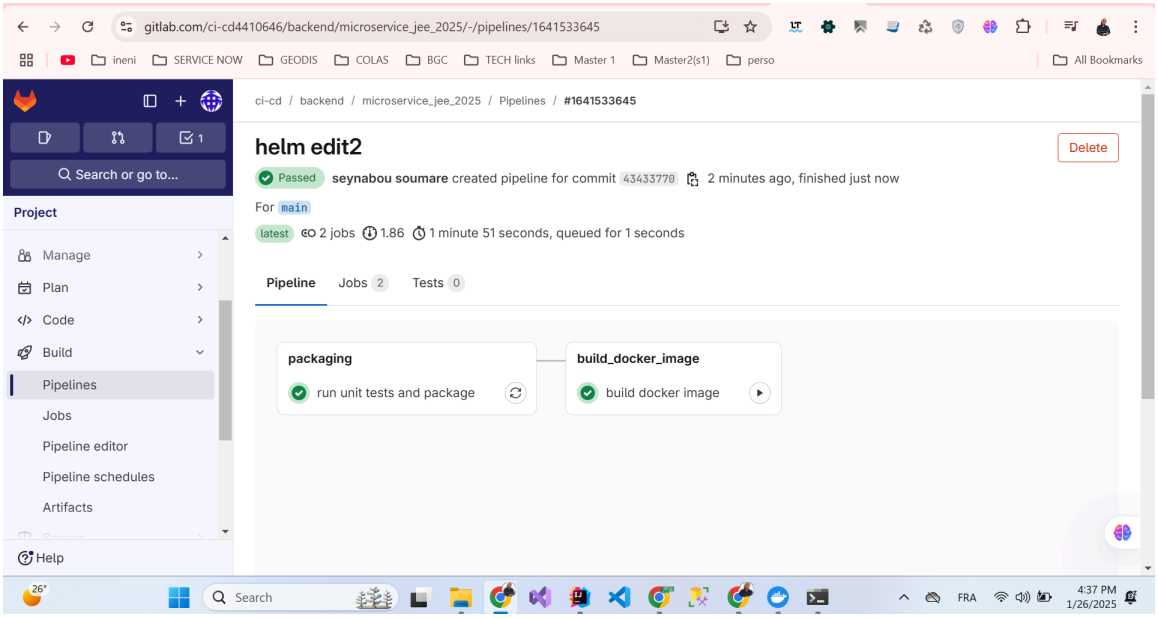

PS C:\Users\Administrator\Documents\ISI\Master 2\Semestre 1\JEE\tp\ecommerce> docker build -t registry.gitlab.com/ci-cd4410646/backend/microservice_jee_2025/stock-ms:3.0 .
[+] Building 8.2s (9/9) FINISHED
docker:desktop-linux
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 394B
=> [internal] load metadata for docker.io/library/openjdk:17-jdk-slim
=> [auth] library/openjdk:pull token for registry-1.docker.io
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [1/3] FROM docker.io/library/openjdk:17-jdk-slim@sha256:aaa3b3cb27e3e520b8f116863d0580c438ed55ecfa0bc126b41f68c3f62f9774
=> => resolve docker.io/library/openjdk:17-jdk-slim@sha256:aaa3b3cb27e3e520b8f116863d0580c438ed55ecfa0bc126b41f68c3f62f9774
=> [internal] load build context
0.1s
0.0s
1.7s
0.0s
0.0s
0.0s
0.1s
0.1s
2.6s
Dockerfile
15:1 CRLF UTF-8 4 spaces
Search
FRA
3:58 PM
1/26/2025

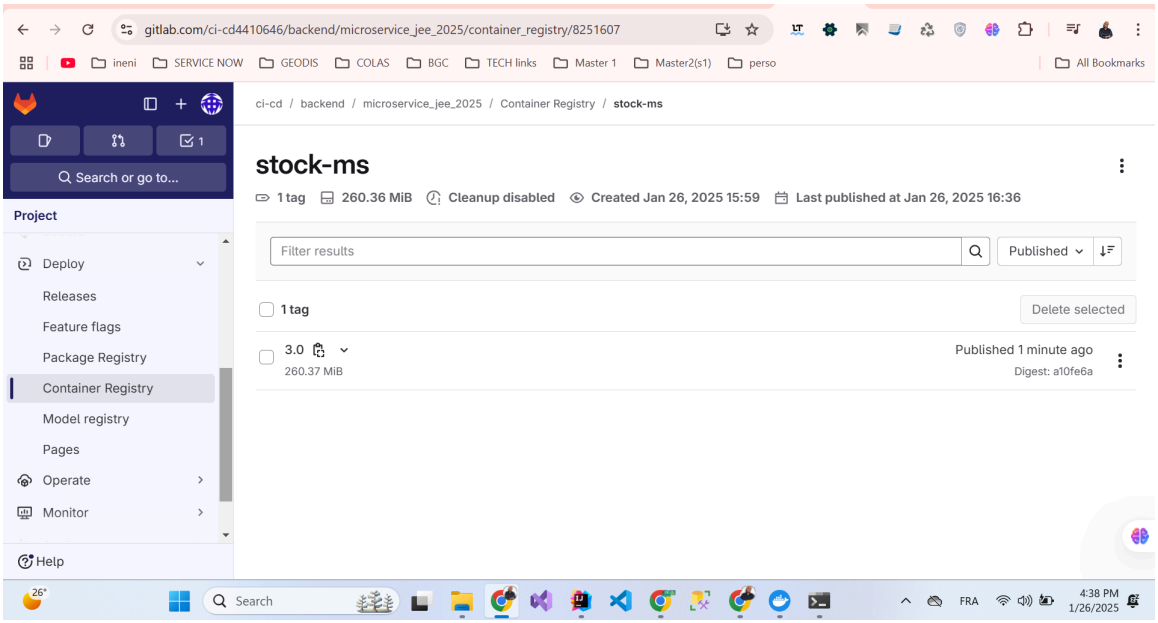

COPY target/stock-ms.jar app.jar
Terminal
Local
=> => naming to registry.gitlab.com/ci-cd4410646/backend/microservice_jee_2025/stock-ms:3.0
=> => unpacking to registry.gitlab.com/ci-cd4410646/backend/microservice_jee_2025/stock-ms:3.0
0.0s
0.5s
View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/gl3ejomc60d56w5ciq4qfjcn7
PS C:\Users\Administrator\Documents\ISI\Master 2\Semestre 1\JEE\tp\ecommerce> docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
registry.gitlab.com/ci-cd4410646/backend/microservice_jee_2025/stock-ms 3.0 bccb0eee8927 38 seconds ago 752MB
<none> <none> 1c9b2d073c0c 6 days ago 338MB
sante v1 fd8b03f666ad 6 days ago 338MB
registry.gitlab.com/ci-cd4410646/k8s-data/sante v1 fd8b03f666ad 6 days ago 338MB
nabousoum/stock-ms 3.0 c816580d25b2 6 days ago 752MB
stock-ms latest c816580d25b2 6 days ago 752MB
<none> <none> b5a3e9613a28 8 days ago 752MB
nginx latest fb197595ebe7 2 months ago 278MB
mariadb 11.5.2 2d50fe0f77da 2 months ago 550MB
ecommerce > Dockerfile
15:1 CRLF UTF-8 4 spaces
Search
FRA
3:59 PM
1/26/2025


.gitignore
8 COPY target/stock-ms.jar app.jar
Terminal
Local
PS C:\Users\Administrator\Documents\ISI\Master 2\Semestre 1\JEE\tp\ecommerce> docker push registry.gitlab.com/ci-cd4410646/backend/microservice_jee_2025/stock-ms:3.0
The push refers to repository [registry.gitlab.com/ci-cd4410646/backend/microservice_jee_2025/stock-ms]
c4878385aa3a: Pushed
6ce99fdf16e8: Pushing [> ] 2.097MB/187.9MB
695902a0b4c5: Pushed
6aaaeb6275c7: Pushing [=> ] 1.049MB/52.17MB
44d3aa8d0766: Pushing [==========>] 1.582MB/1.582MB
1fe172e4850f: Pushing [=> ] 1.049MB/31.38MB

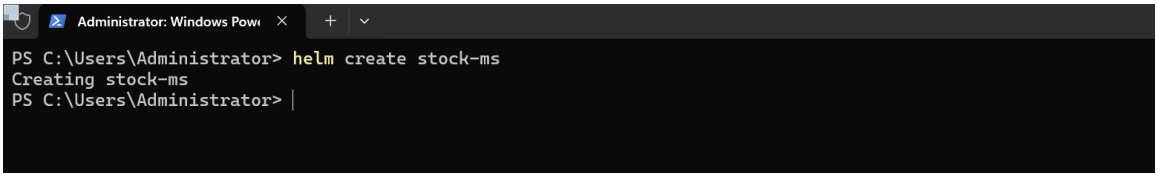

gitlab.com/ci-cd4410646/backend/microservice_jee_2025/container_registry
ci-cd / backend / microservice_jee_2025 / Container Registry
Container Registry
CLI Commands
1 Image repository
Cleanup is not scheduled. Set up cleanup
Container Scanning for Registry: Off
Filter results
Updated
microservice_jee_2025/stock-ms
1 tag
Published 19 minutes ago
Search or go to...
Project
microservice_jee_2025
Pinned
Issues
Merge requests
Manage
Plan
Code
Build
Secure
Help
Search
FRA
4:19 PM
1/26/2025

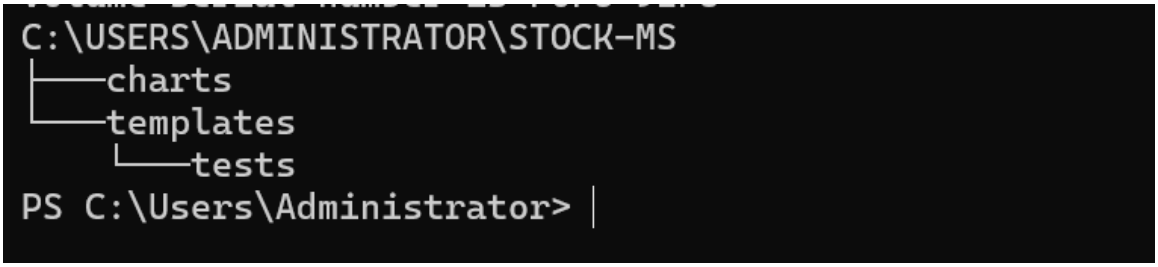

ecommerce
main
EcommerceApplication
Project
src
target
.gitattributes
.gitignore
.gitlab-ci.yml
Dockerfile
HELP.md
mvnw
mvnw.cmd
namespace-devops.yaml
pom.xml
stock-ms-deployment.yaml
stock-ms-service.yaml
application.yml
Dockerfile
pom.xml (ecommerce)
.gitlab-ci.yml
build docker image:
script:
- docker login -u $CI_REGISTRY_USER -p $CI_REGISTRY_PASSWORD $CI_REGISTRY
- docker push $CI_REGISTRY/ci-cd4410646/backend/microservice_jee_2025/stock-ms:3.0
- echo "Image built"
artifacts:
paths:
- stock-ms.tar
when: manual
Terminal
Local
Delta compression using up to 8 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 770 bytes | 770.00 KiB/s, done.
Total 5 (delta 1), reused 0 (delta 0), pack-reused 0 (from 0)
To https://gitlab.com/ci-cd4410646/backend/microservice_jee_2025.git
b6776e9..de248a5 main -> main
PS C:\Users\Administrator\Documents\ISI\Master 2\Semestre 1\JEE\tp\ecommerce> docker build -t registry.gitlab.com/ci-cd4410646/backend/microservice_jee_2025/stock-ms:3.0 .
Search
4:33 PM
1/26/2025

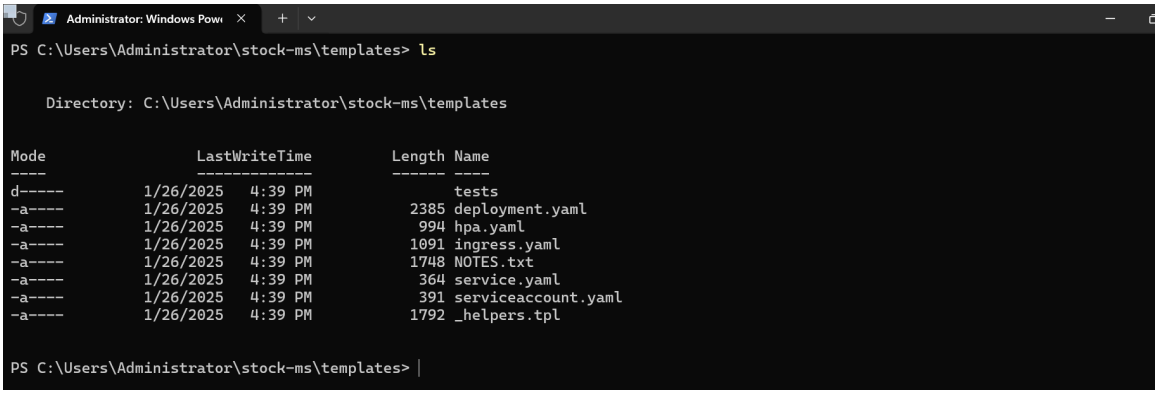

gitlab.com/ci-cd4410646/backend/microservice_jee_2025/-/pipelines/1641533645
ci-cd / backend / microservice_jee_2025 / Pipelines / #1641533645
helm edit2
Delete
Passed
seynabou soumare created pipeline for commit 43433770 2 minutes ago, finished just now
For main
latest 2 jobs 1.86 1 minute 51 seconds, queued for 1 seconds
Pipeline
Jobs 2
Tests 0
packaging
run unit tests and package
build_docker_image
build docker image
Search or go to...
Project
Manage
Plan
Code
Build
Pipelines
Jobs
Pipeline editor
Pipeline schedules
Artifacts
Help
Search
4:37 PM
1/26/2025

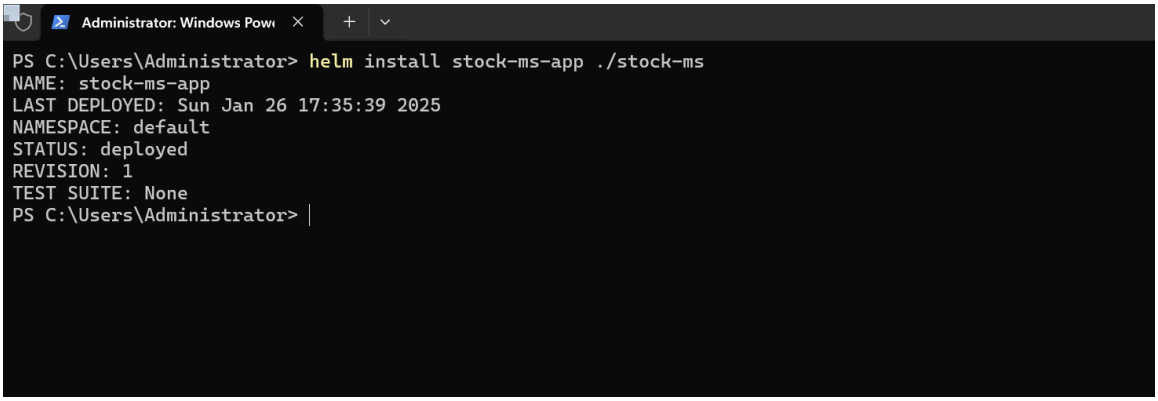


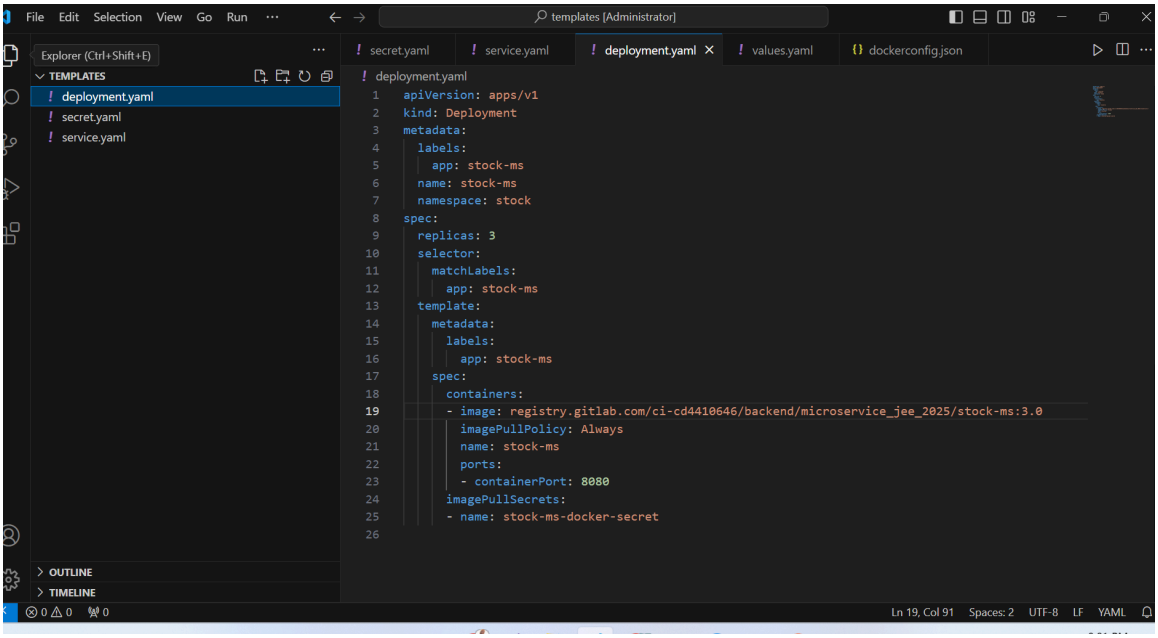

## 7. Creation de HELM chart

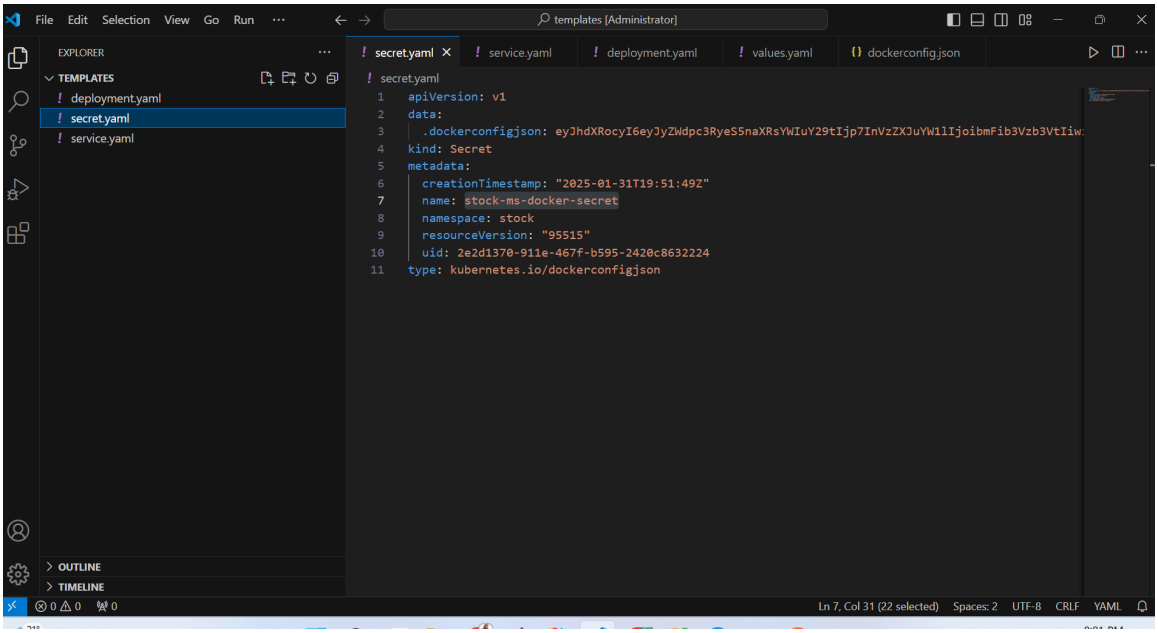


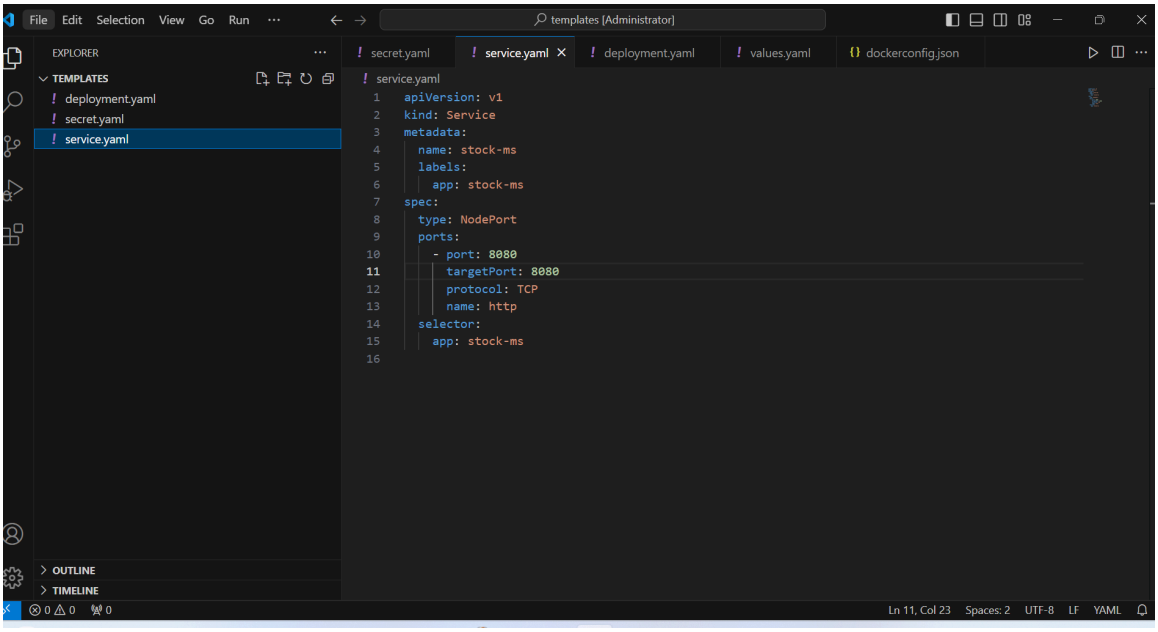




Administrator: Windows Powe
PS C:\Users\Administrator\stock-ms\templates> ls
Directory: C:\Users\Administrator\stock-ms\templates
Mode LastWriteTime Length Name
d----- 1/26/2025 4:39 PM tests
-a---- 1/26/2025 4:39 PM 2385 deployment.yaml
-a---- 1/26/2025 4:39 PM 994 hpa.yaml
-a---- 1/26/2025 4:39 PM 1091 ingress.yaml
-a---- 1/26/2025 4:39 PM 1748 NOTES.txt
-a---- 1/26/2025 4:39 PM 364 service.yaml
-a---- 1/26/2025 4:39 PM 391 serviceaccount.yaml
-a---- 1/26/2025 4:39 PM 1792 _helpers.tpl
PS C:\Users\Administrator\stock-ms\templates>


Administrator: Windows Powe
PS C:\Users\Administrator> helm install stock-ms-app ./stock-ms
NAME: stock-ms-app
LAST DEPLOYED: Sun Jan 26 17:35:39 2025
NAMESPACE: default
STATUS: deployed
REVISION: 1
TEST SUITE: None
PS C:\Users\Administrator>


File Edit Selection View Go Run
templates [Administrator]
Explorer (Ctrl+Shift+E)
TEMPLATES
deployment.yaml
secret.yaml
service.yaml
OUTLINE
TIMELINE
secret.yaml
service.yaml
deployment.yaml
values.yaml
dockerconfig.json
deployment.yaml
1 apiVersion: apps/v1
2 kind: Deployment
3 metadata:
4 labels:
5 app: stock-ms
6 name: stock-ms
7 namespace: stock
8 spec:
9 replicas: 3
10 selector:
11 matchLabels:
12 app: stock-ms
13 template:
14 metadata:
15 labels:
16 app: stock-ms
17 spec:
18 containers:
19 - image: registry.gitlab.com/ci-cd4410646/backend/microservice_jee_2025/stock-ms:3.0
20 imagePullPolicy: Always
21 name: stock-ms
22 ports:
23 - containerPort: 8080
24 imagePullSecrets:
25 - name: stock-ms-docker-secret
26
Ln 19, Col 91 Spaces: 2 UTF-8 LF YAML

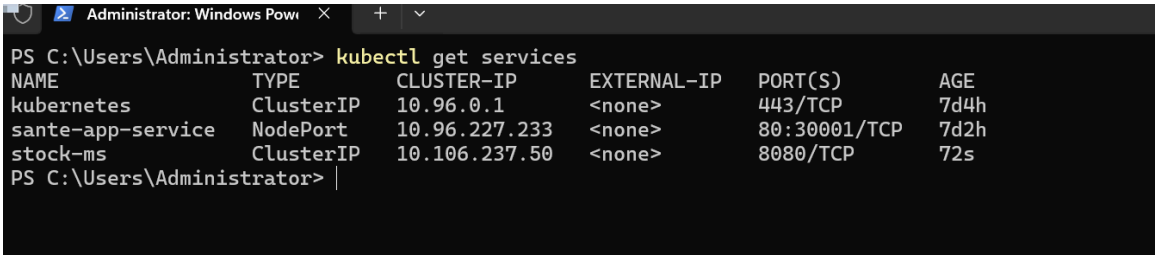

File Edit Selection View Go Run
templates [Administrator]
EXPLORER
TEMPLATES
deployment.yaml
secret.yaml
service.yaml
OUTLINE
TIMELINE
secret.yaml
service.yaml
deployment.yaml
values.yaml
dockerconfig.json
secret.yaml
1 apiVersion: v1
2 data:
3 .dockerconfigjson: eyJhdXRocyI6eyJyZWdpc3RyeS5naXRsYWIuY29tIjp7InVzZXJuYW1lIjoibmFib3Vzb3VtIiw
4 kind: Secret
5 metadata:
6 creationTimestamp: "2025-01-31T19:51:49Z"
7 name: stock-ms-docker-secret
8 namespace: stock
9 resourceVersion: "95515"
10 uid: 2e2d1370-911e-467f-b595-2420c8632224
11 type: kubernetes.io/dockerconfigjson
Ln 7, Col 31 (22 selected) Spaces: 2 UTF-8 CRLF YAML

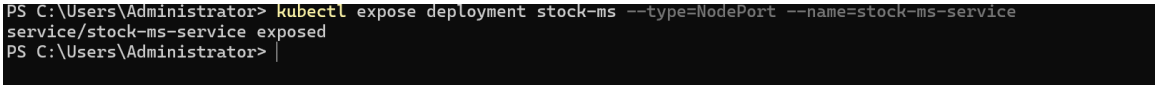



```
PS C:\Users\Administrator> kubectl get pods
NAME                                  READY   STATUS             RESTARTS       AGE
sante-app-deployment-595cdc69c4-q4mt4   1/1     Running            1 (120m ago)   6d20h
stock-ms-859b789588-c7vrd             0/1     InvalidImageName   0              46s
stock-ms-859b789588-rvxxv             0/1     InvalidImageName   0              46s
PS C:\Users\Administrator> kubectl get deploy
NAME                 READY   UP-TO-DATE   AVAILABLE   AGE
sante-app-deployment   1/1     1            1           6d20h
stock-ms             0/2     2            0           71s
PS C:\Users\Administrator>
```

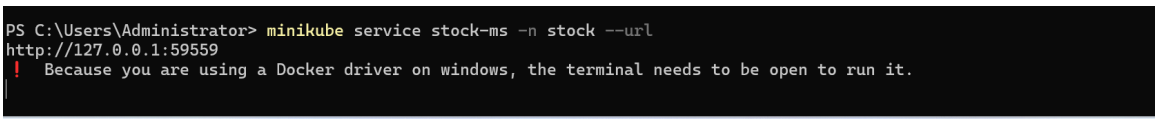
```
PS C:\Users\Administrator> kubectl get svc -n stock
NAME       TYPE       CLUSTER-IP      EXTERNAL-IP   PORT(S)          AGE
stock-ms   NodePort   10.107.79.183   <none>        8080:32042/TCP   9m42s
PS C:\Users\Administrator>
```

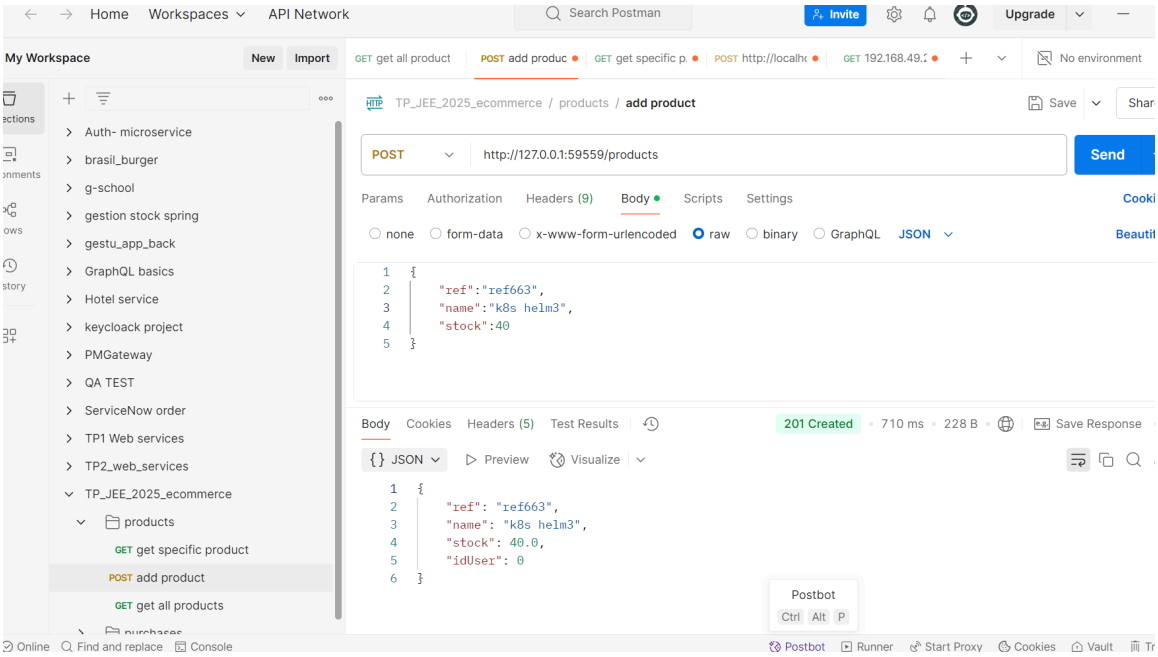
```
NAME                        READY   STATUS    RESTARTS   AGE
stock-ms-7d7f975b59-b5tk5   1/1     Running   0          9m13s
stock-ms-7d7f975b59-bm4k7   1/1     Running   0          9m13s
stock-ms-7d7f975b59-srfkk   1/1     Running   0          9m13s
PS C:\Users\Administrator>
```




minikube service stock-ms--url




docker pull registry.gitlab.com/ci-cd4410646/backend/microservice_jee_2025/stock-ms:3.0