Django CRM - Container Orchestration Final Assignment

Project Report

Richard Andrey Biscazzi - 8903530

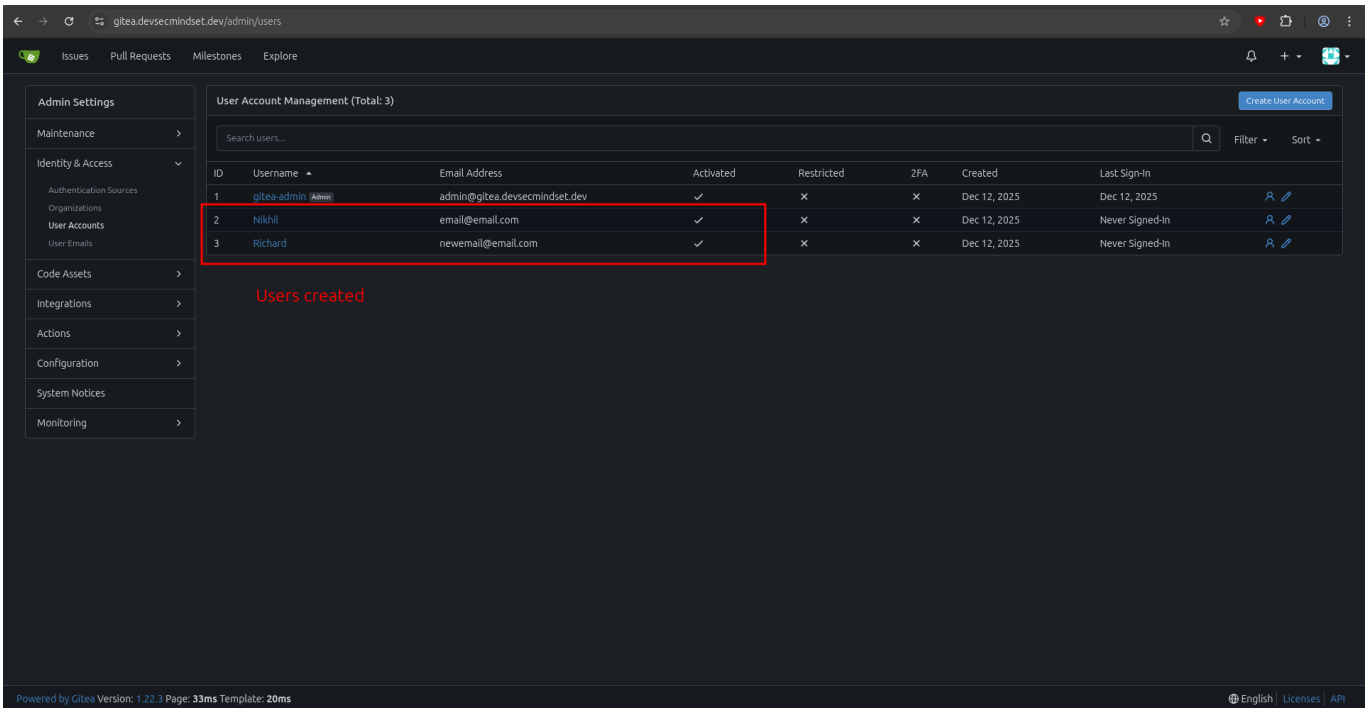
Nikhil Shankar Chirakkal Sivasankaran - 9026254

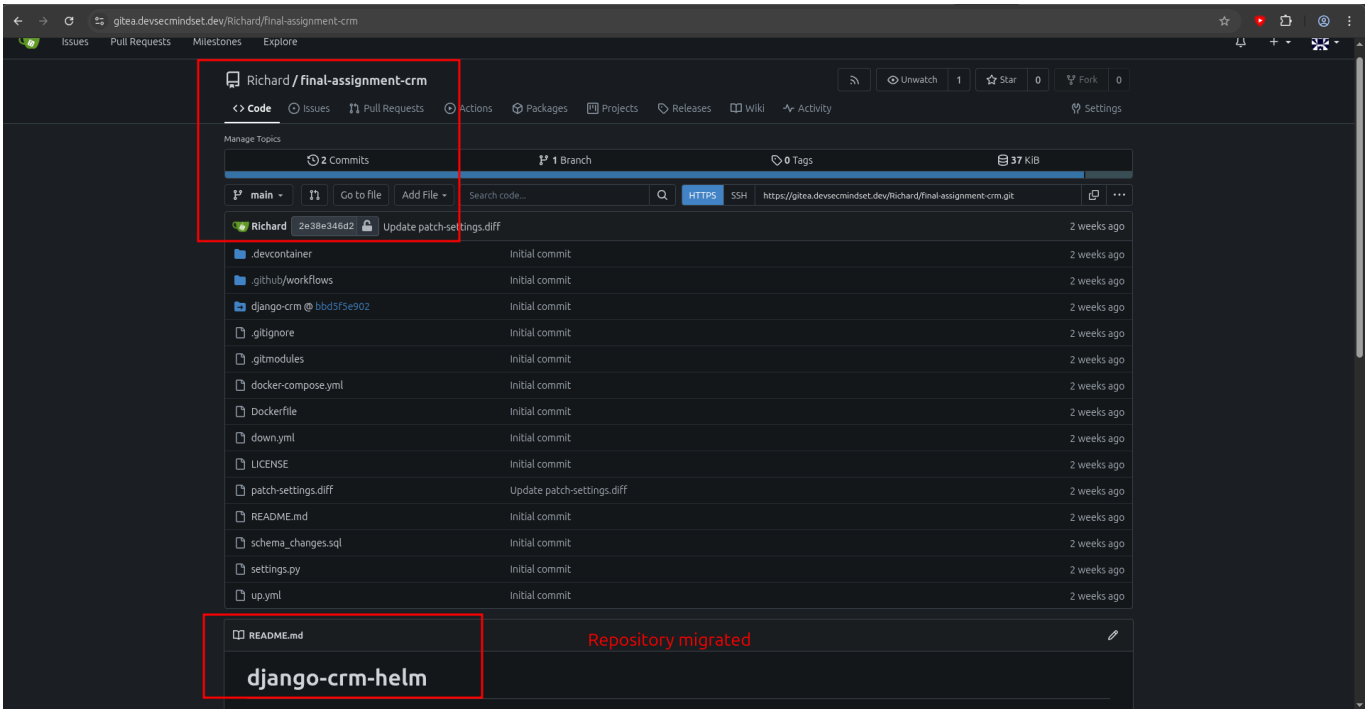
Step 1: Gitea Repository Setup

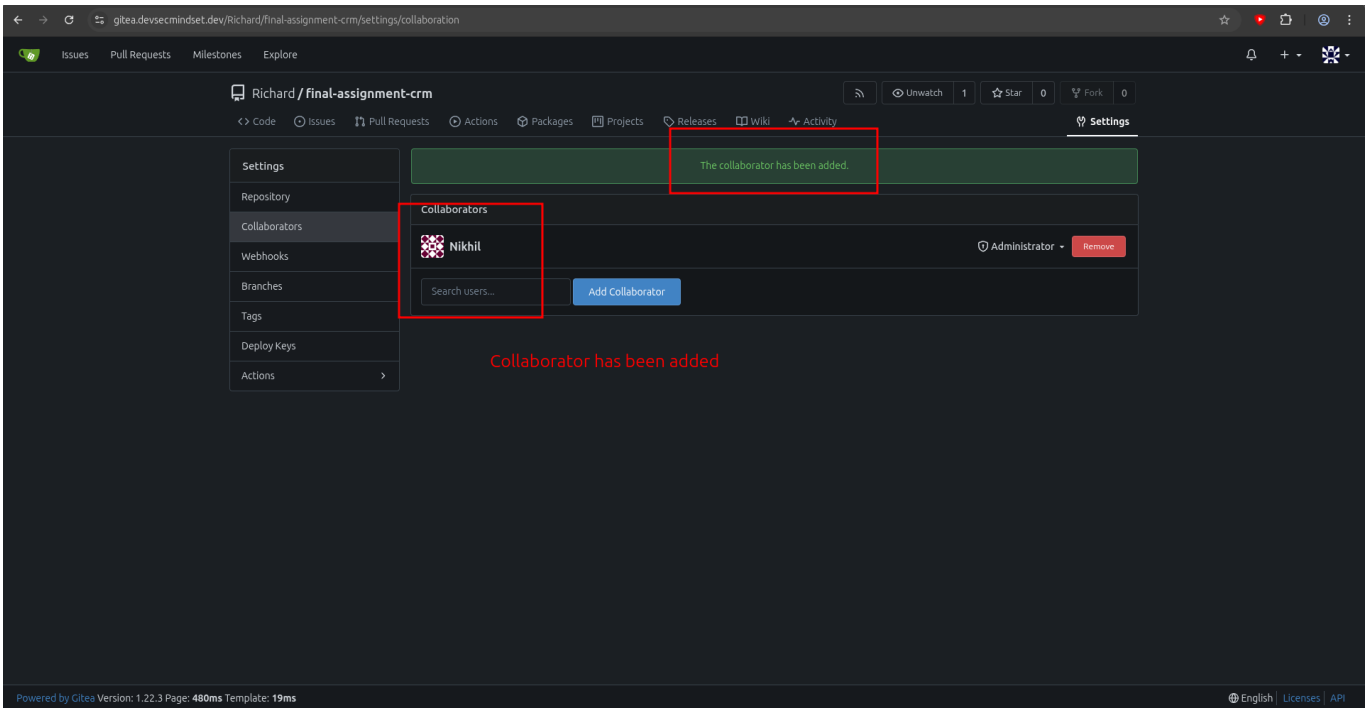
Tasks Completed:

- Cloned repository to Gitea: `https://gitea.devsecmindset.dev/Richard/final-assignment-crm.git`
- Added teammates as collaborators
- Repository configured with proper access

Screenshots:


gitea.devsecmindset.dev/admin/users
Issues
Pull Requests
Milestones
Explore
Admin Settings
Maintenance
Identity & Access
Authentication Sources
Organizations
User Accounts
User Emails
Code Assets
Integrations
Actions
Configuration
System Notices
Monitoring
User Account Management (Total: 3)
Create User Account
Search users...
Filter
Sort
ID
Username
Email Address
Activated
Restricted
2FA
Created
Last Sign-In
1 gitea-admin Admin admin@gitea.devsecmindset.dev Dec 12, 2025 Dec 12, 2025
2 Nikhil email@email.com Never Signed-In
3 Richard newemail@email.com Never Signed-In
Users created
Powered by Gitea Version: 1.22.3 Page: 33ms Template: 20ms
English | Licenses | API


gitea.devsecmindset.dev/Richard/final-assignment-crm
Issues
Pull Requests
Milestones
Explore
Richard / final-assignment-crm
Unwatch 1
Star 0
Fork 0
Code
Issues
Pull Requests
Actions
Packages
Projects
Releases
Wiki
Activity
Settings
Manage Topics
2 Commits
1 Branch
0 Tags
37 KiB
main
Go to file
Add File
Search code...
HTTPS
SSH
https://gitea.devsecmindset.dev/Richard/final-assignment-crm.git
Richard 2e38e346d2 Update patch-settings.diff 2 weeks ago
.devcontainer Initial commit 2 weeks ago
.github/workflows Initial commit 2 weeks ago
django-crm @ bbd5f5e902 Initial commit 2 weeks ago
.gitignore Initial commit 2 weeks ago
.gitmodules Initial commit 2 weeks ago
docker-compose.yml Initial commit 2 weeks ago
Dockerfile Initial commit 2 weeks ago
down.yml Initial commit 2 weeks ago
LICENSE Initial commit 2 weeks ago
patch-settings.diff Update patch-settings.diff 2 weeks ago
README.md Initial commit 2 weeks ago
schema_changes.sql Initial commit 2 weeks ago
settings.py Initial commit 2 weeks ago
up.yml Initial commit 2 weeks ago
README.md
Repository migrated
django-crm-helm

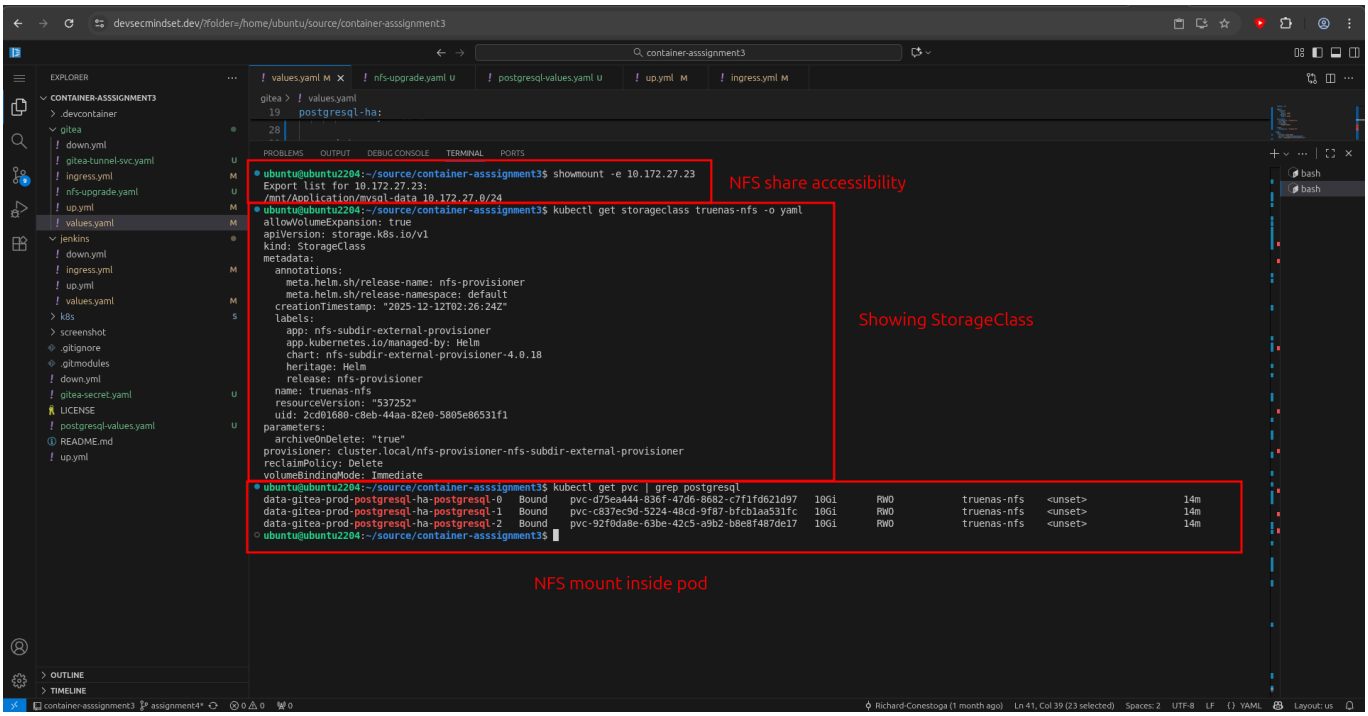


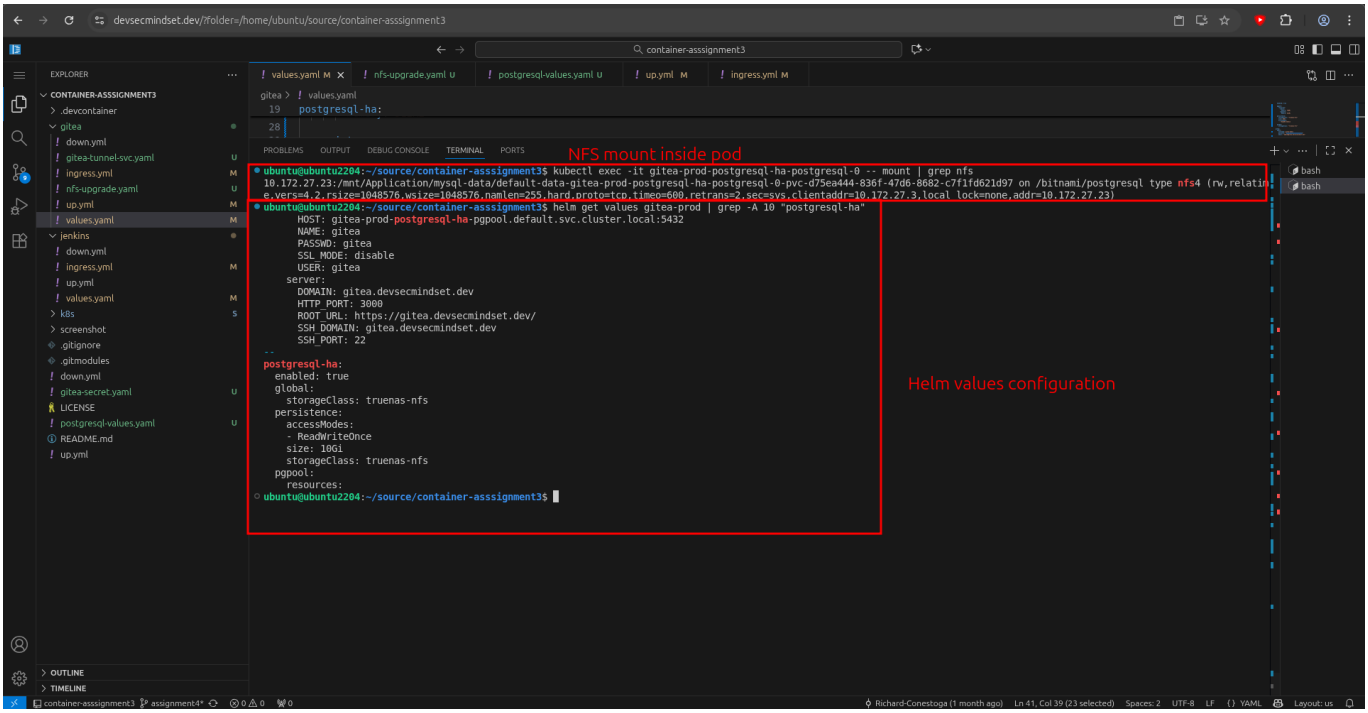
Step 2: NFS Storage Configuration

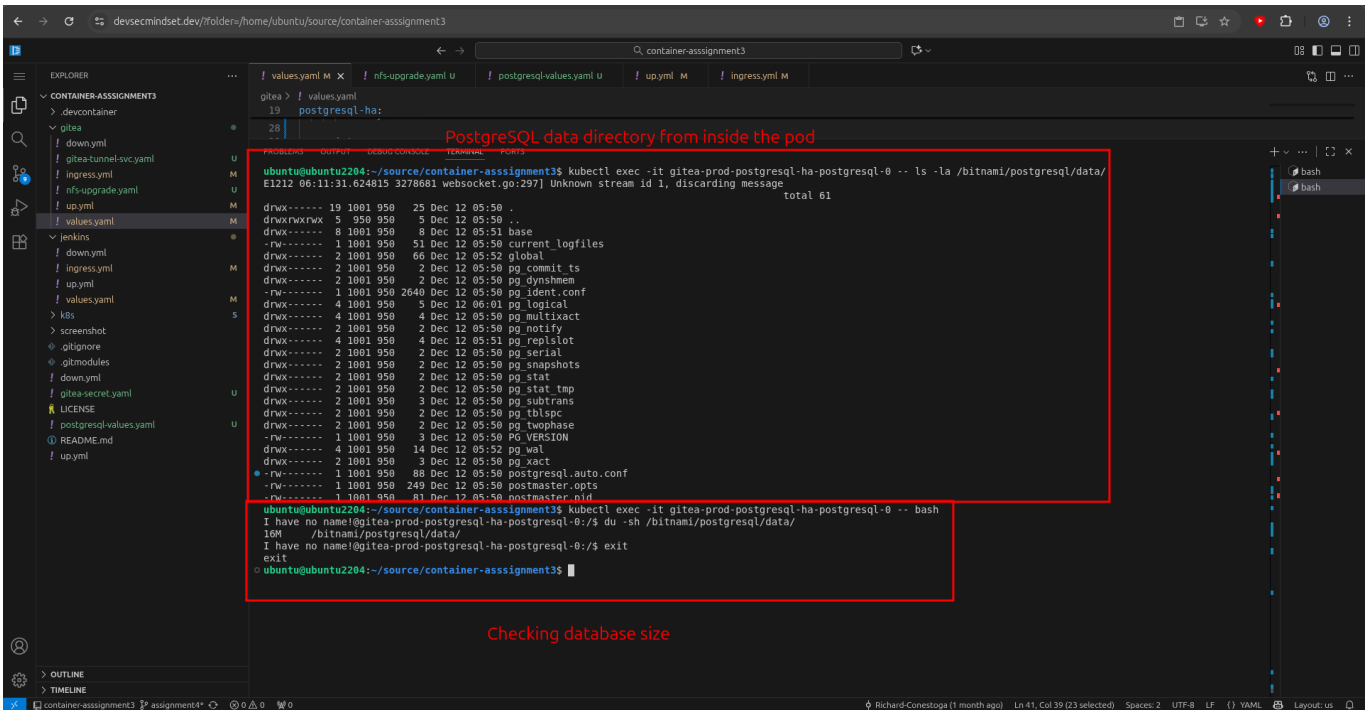
Tasks Completed:

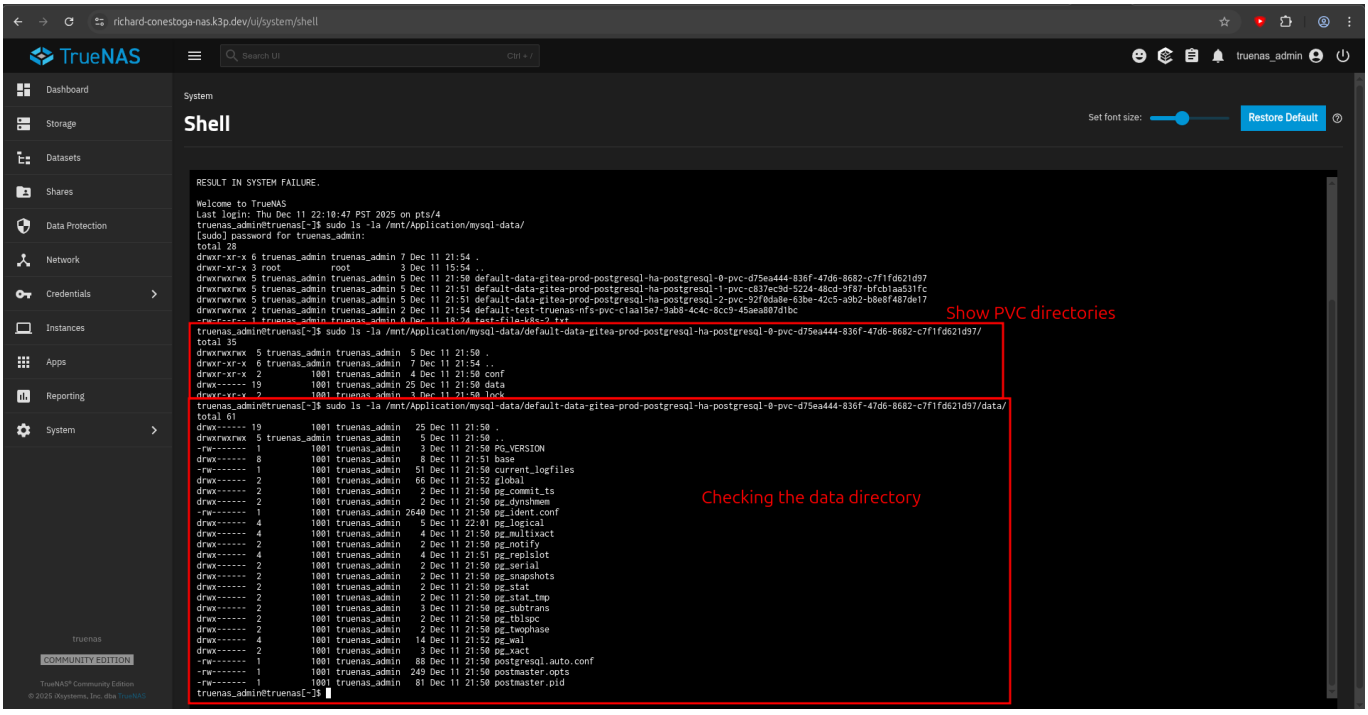
- Configured TrueNAS NFS storage for database persistence
- Created StorageClass: `truenas-nfs`
- Verified NFS mount accessibility
- Database PVCs created and bound

Screenshots:


NFS share accessibility
Showing StorageClass
NFS mount inside pod


NFS mount inside pod
Helm values configuration





Step 3: CI/CD Pipeline with Gitea Actions

Tasks Completed:

- Created Gitea personal access token with package write permissions
- Set up Gitea Actions runner using Docker
- Created `.gitea/workflows/build-and-push.yml` workflow file
- Configured automated Docker image build on code push
- Configured automated push to Gitea container registry
- Fixed Dockerfile to include g++ compiler for numpy dependencies
- Successfully built and pushed image to `gitea.devsecmindset.dev/nikhil/final-assignment-crm`

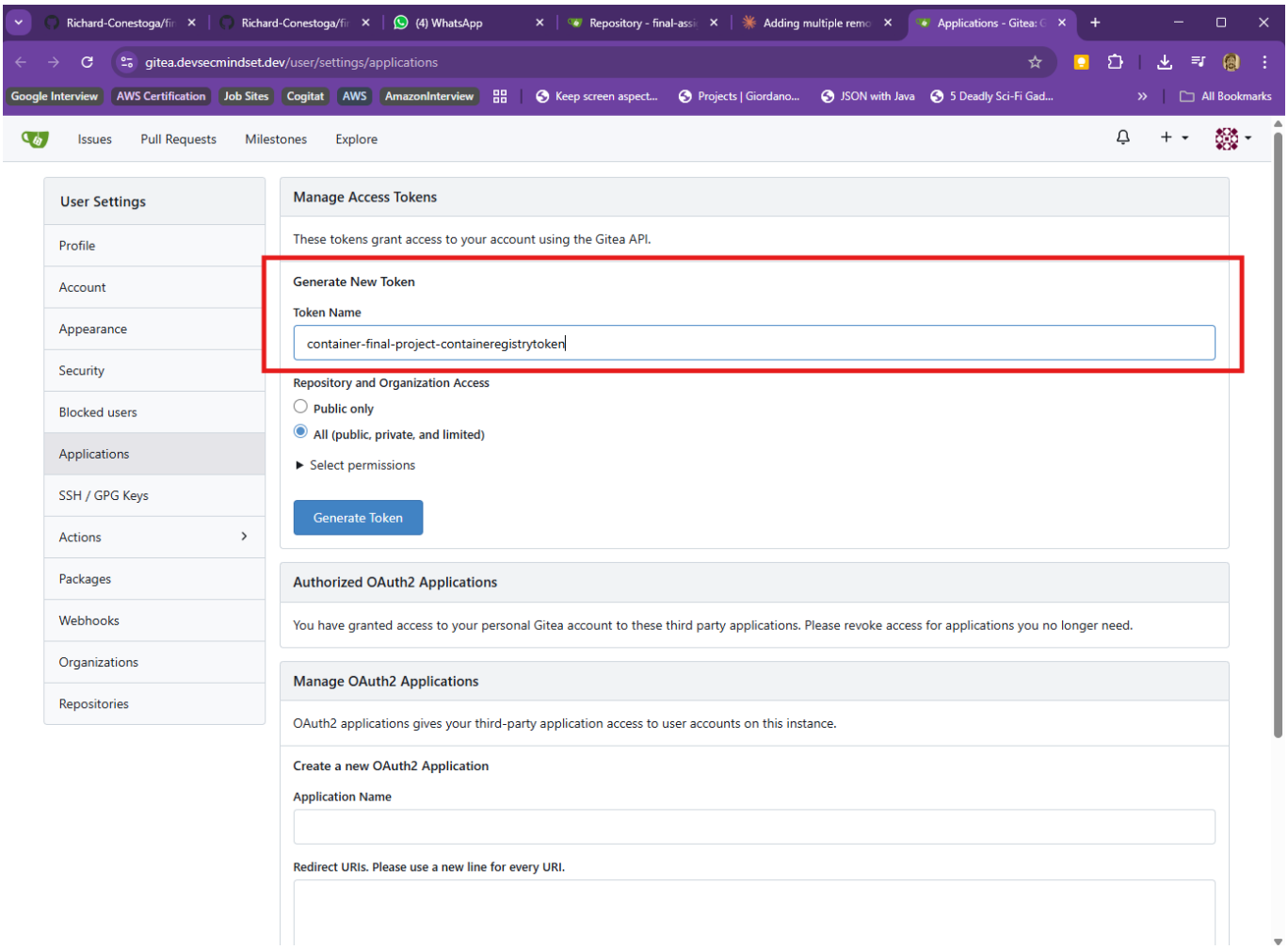
Runner Setup Process:

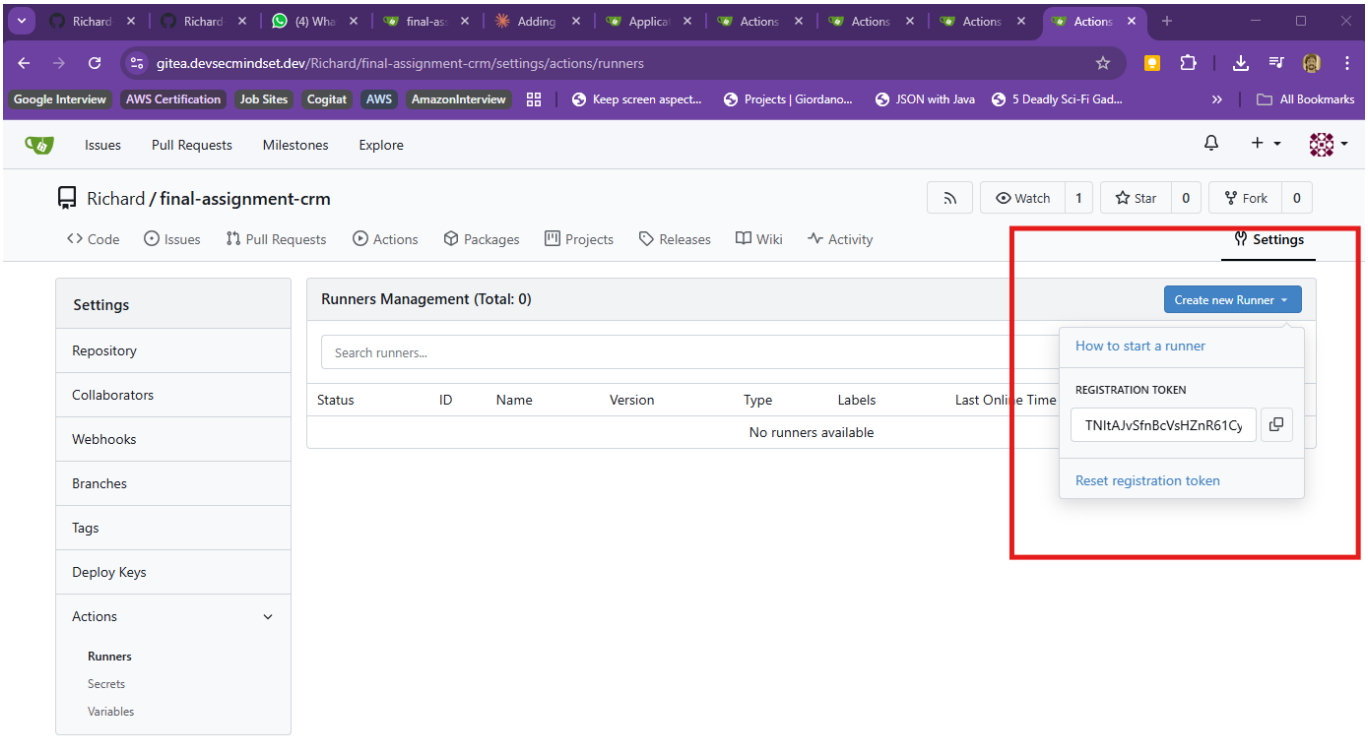
1. Generated Gitea token with `write:package` permission
2. Added token as repository secret (`GITEATOKEN`)
3. Created runner registration token from repository settings
4. Deployed runner using Docker:

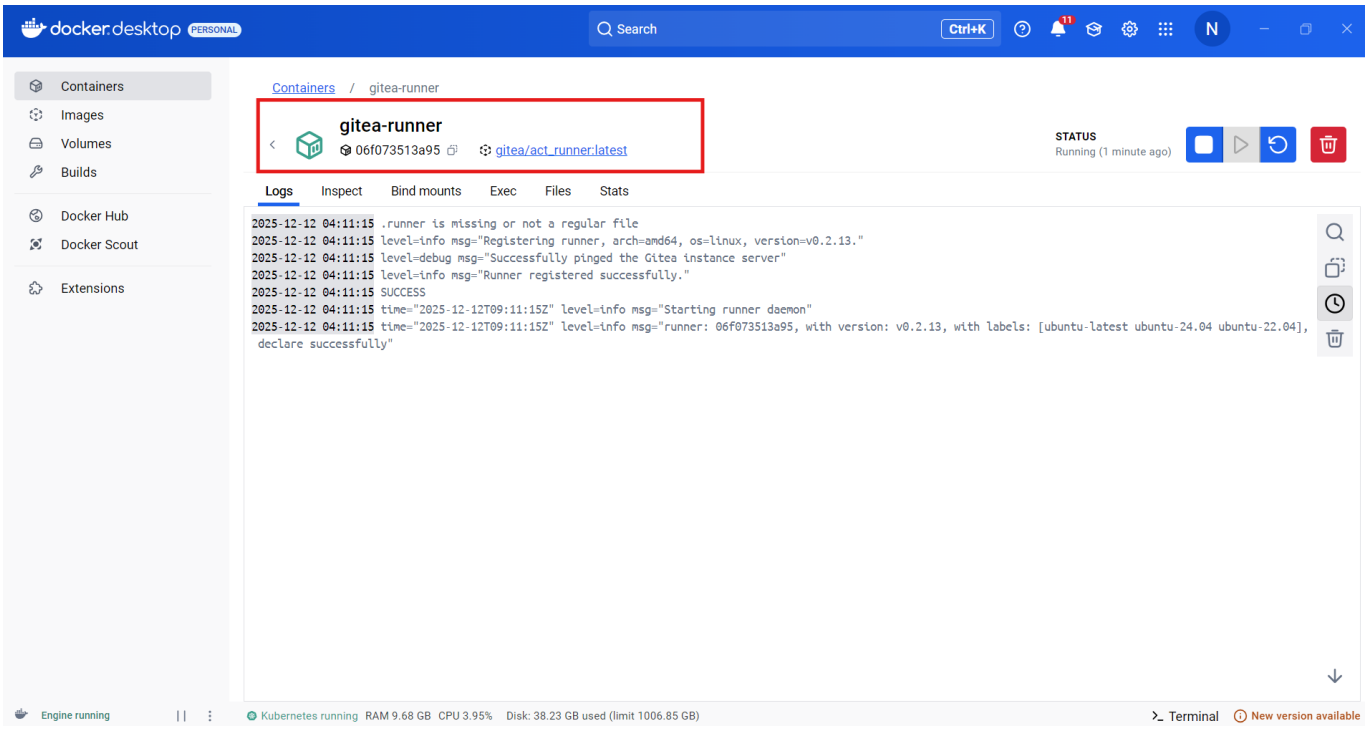
```
docker run -d --name gitea-runner \
  -e GITEA_INSTANCE_URL=https://gitea.devsecmindset.dev \
  -e GITEA_RUNNER_REGISTRATION_TOKEN=<token> \
  -v /var/run/docker.sock:/var/run/docker.sock \
  gitea/act_runner:latest
```

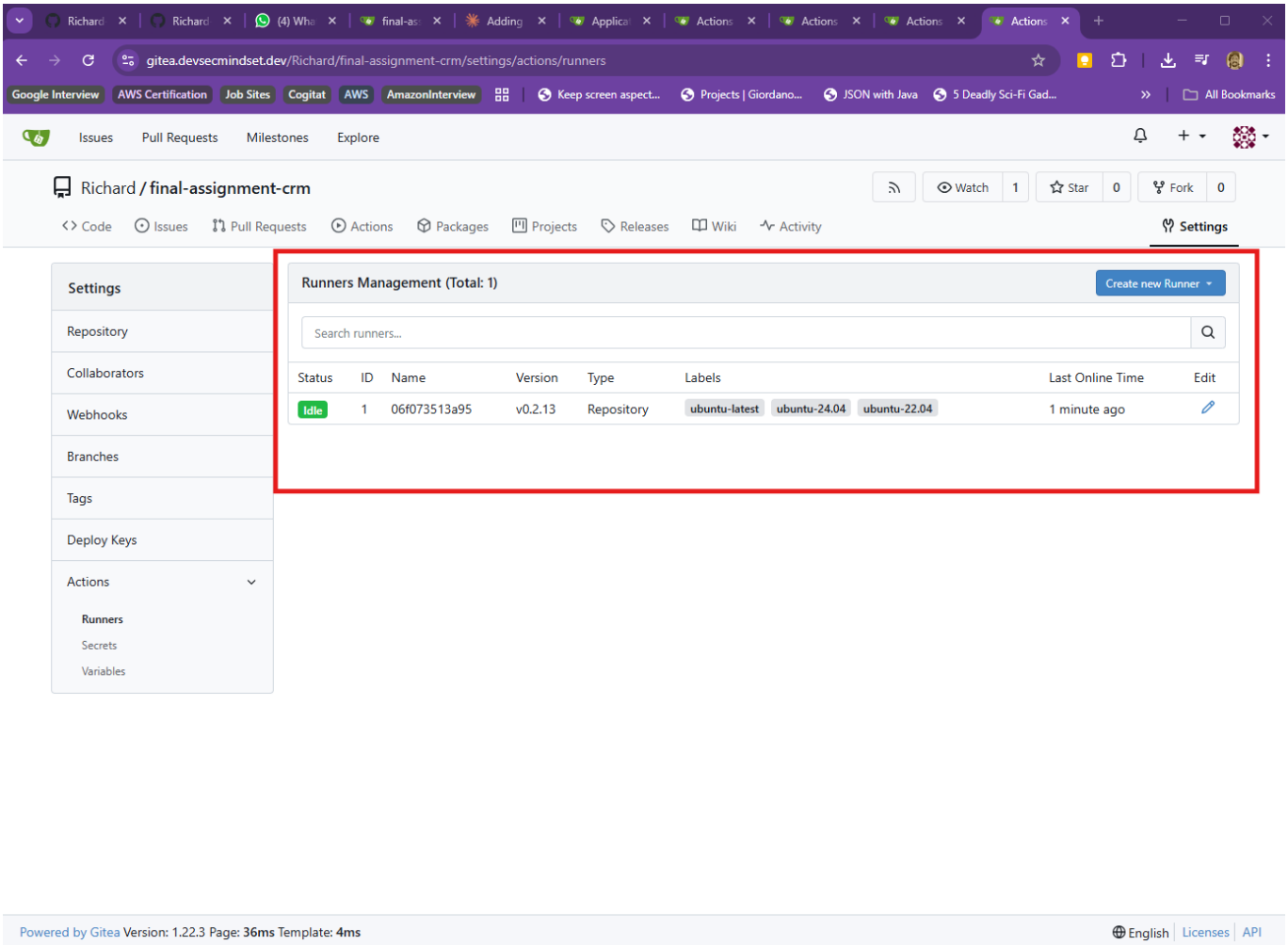
5. Verified runner registered and active in repository settings

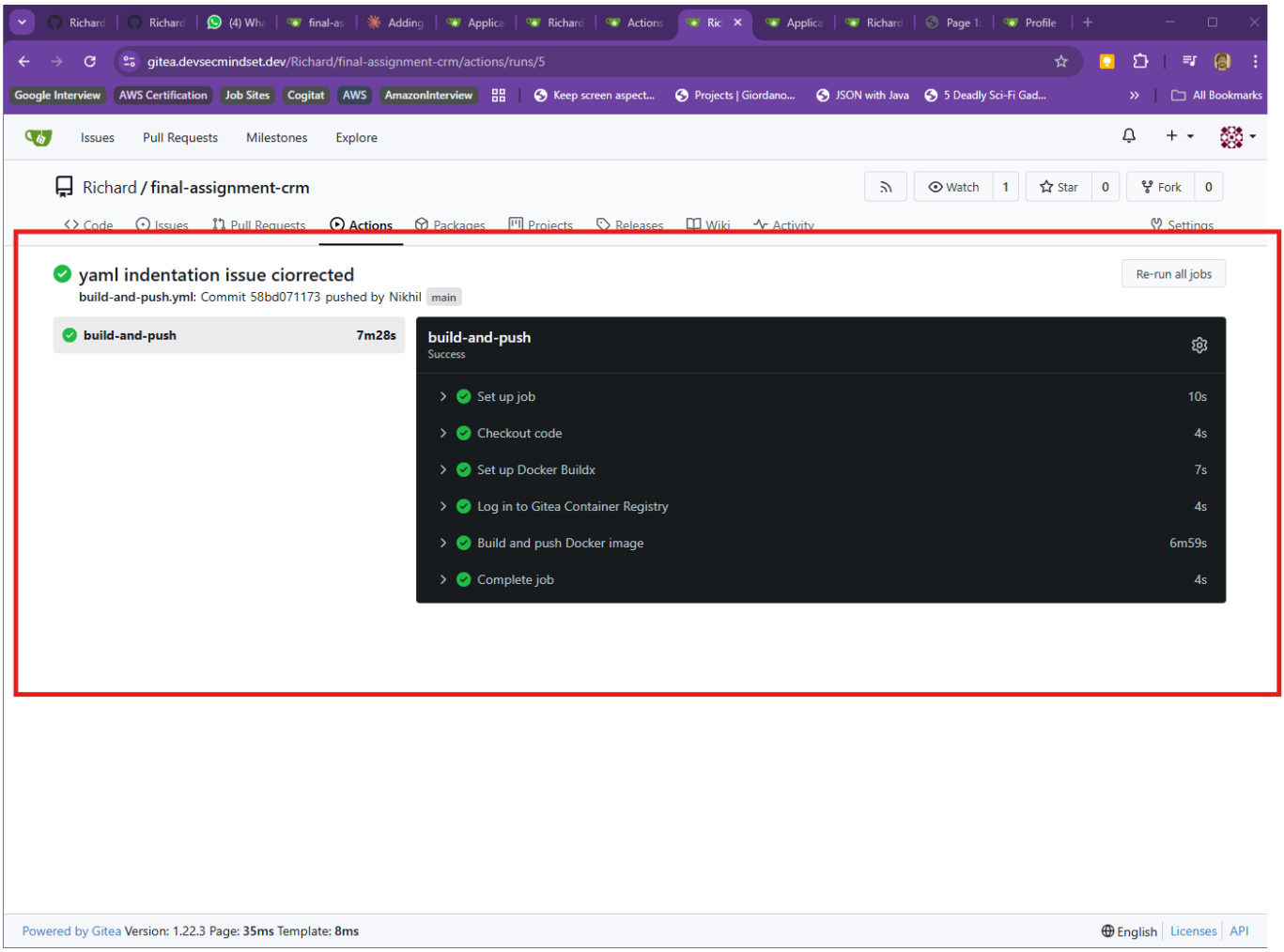
Screenshots:

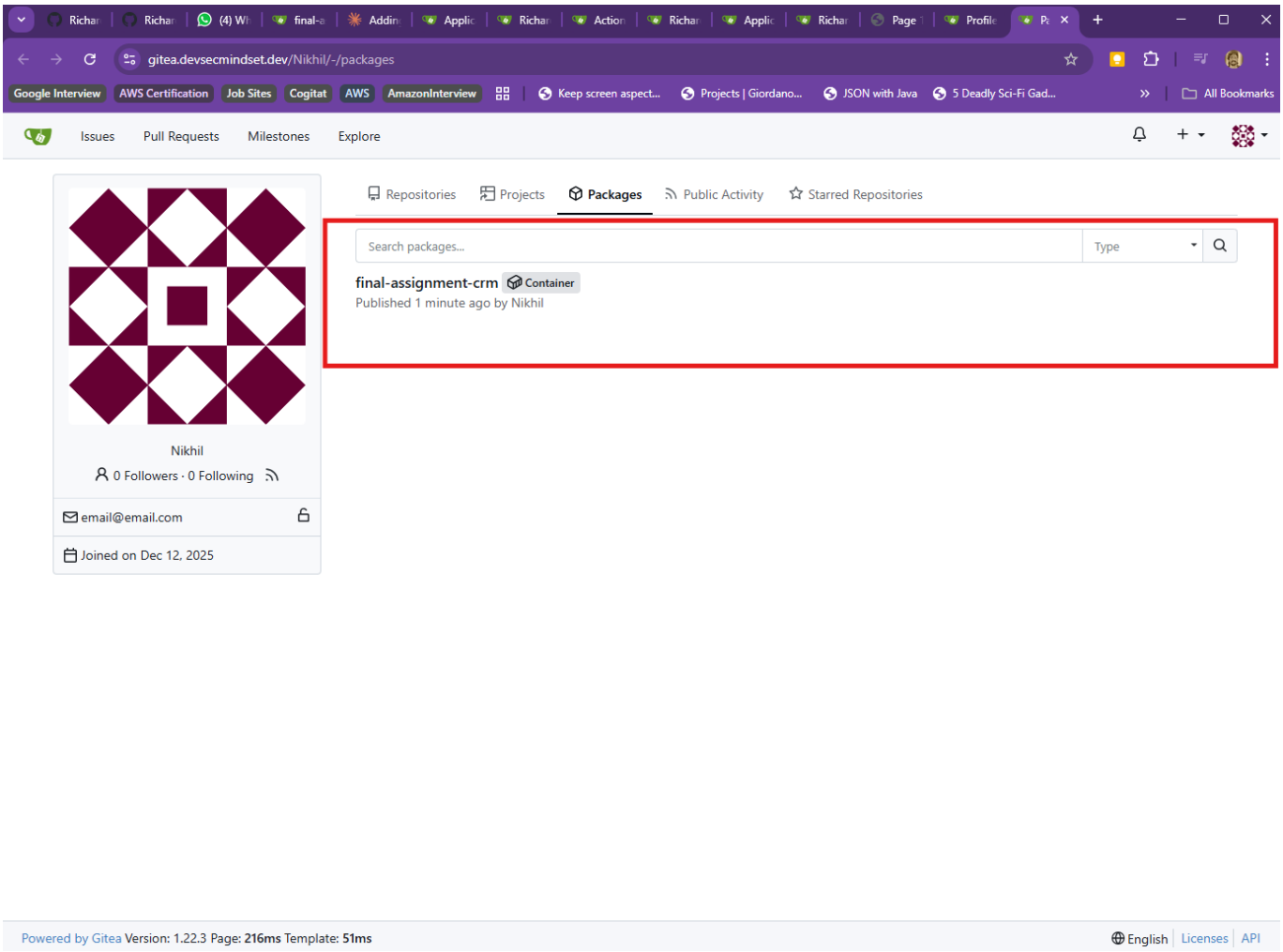

gitea.devsecmindset.dev/user/settings/applications
Issues
Pull Requests
Milestones
Explore
User Settings
Profile
Account
Appearance
Security
Blocked users
Applications
SSH / GPG Keys
Actions
Packages
Webhooks
Organizations
Repositories
Manage Access Tokens
These tokens grant access to your account using the Gitea API.
Generate New Token
Token Name
container-final-project-containeregistrytoken
Repository and Organization Access
Public only
All (public, private, and limited)
Select permissions
Generate Token
Authorized OAuth2 Applications
You have granted access to your personal Gitea account to these third party applications. Please revoke access for applications you no longer need.
Manage OAuth2 Applications
OAuth2 applications gives your third-party application access to user accounts on this instance.
Create a new OAuth2 Application
Application Name
Redirect URIs. Please use a new line for every URI.

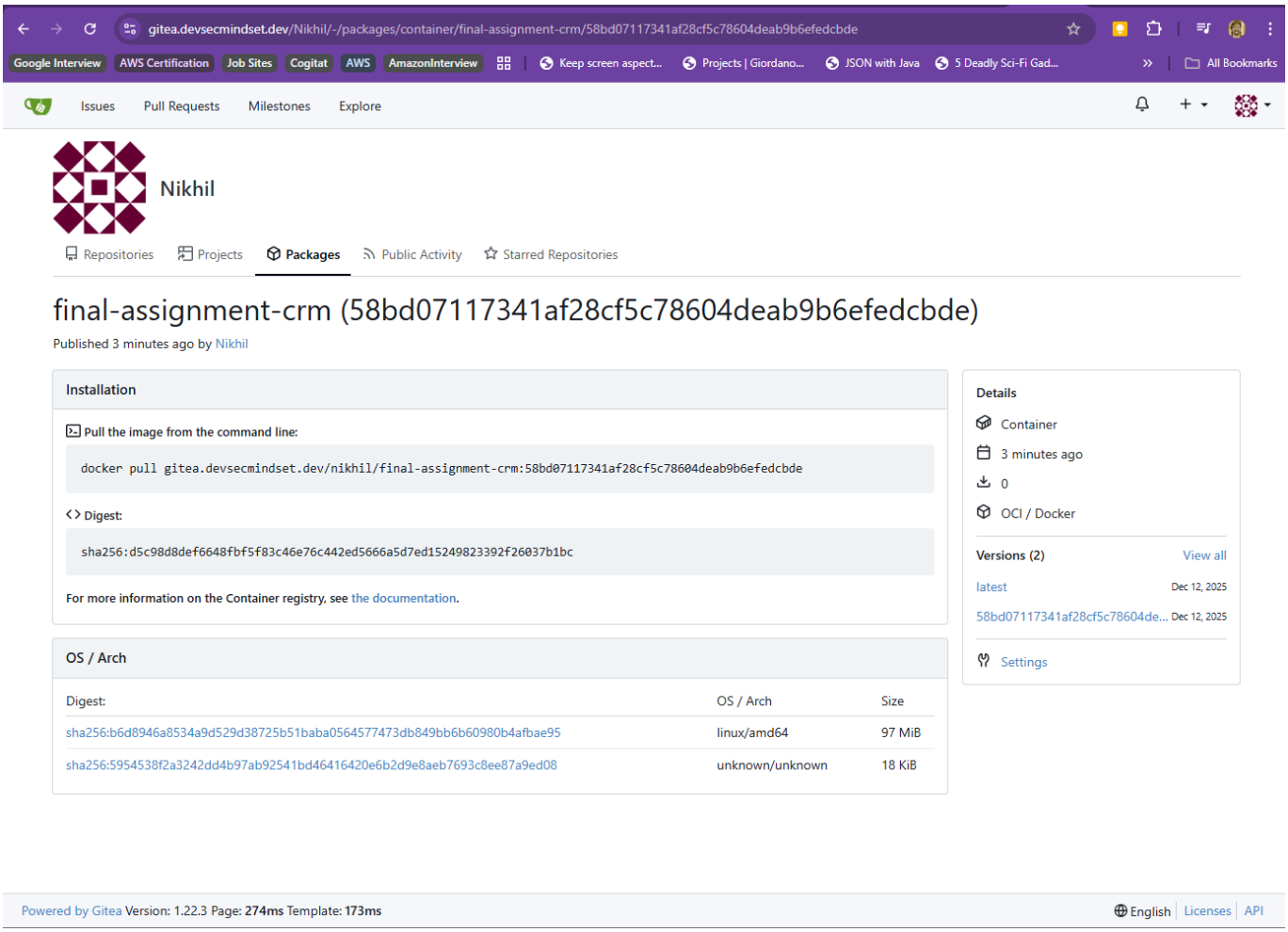

gitea.devsecmindset.dev/Richard/final-assignment-crm/settings/actions/runners
Issues
Pull Requests
Milestones
Explore
Richard / final-assignment-crm
Watch 1
Star 0
Fork 0
Code
Issues
Pull Requests
Actions
Packages
Projects
Releases
Wiki
Activity
Settings
Settings
Repository
Collaborators
Webhooks
Branches
Tags
Deploy Keys
Actions
Runners
Secrets
Variables
Runners Management (Total: 0)
Create new Runner
How to start a runner
REGISTRATION TOKEN
TNItAJvSfnBcVsHZnR61Cy
Reset registration token
Search runners...
Status
ID
Name
Version
Type
Labels
Last Online Time
No runners available


docker desktop PERSONAL
Search Ctrl+K
Containers
Images
Volumes
Builds
Docker Hub
Docker Scout
Extensions
Containers / gitea-runner
gitea-runner
06f073513a95
gitea/act_runner:latest
STATUS
Running (1 minute ago)
Logs Inspect Bind mounts Exec Files Stats
2025-12-12 04:11:15 .runner is missing or not a regular file
2025-12-12 04:11:15 level=info msg="Registering runner, arch=amd64, os=linux, version=v0.2.13."
2025-12-12 04:11:15 level=debug msg="Successfully pinged the Gitea instance server"
2025-12-12 04:11:15 level=info msg="Runner registered successfully."
2025-12-12 04:11:15 SUCCESS
2025-12-12 04:11:15 time="2025-12-12T09:11:15Z" level=info msg="Starting runner daemon"
2025-12-12 04:11:15 time="2025-12-12T09:11:15Z" level=info msg="runner: 06f073513a95, with version: v0.2.13, with labels: [ubuntu-latest ubuntu-24.04 ubuntu-22.04], declare successfully"
Engine running
Kubernetes running RAM 9.68 GB CPU 3.95% Disk: 38.23 GB used (limit 1006.85 GB)
Terminal
New version available


gitea.devsecmindset.dev/Richard/final-assignment-crm/settings/actions/runners
Issues Pull Requests Milestones Explore
Richard / final-assignment-crm
Watch 1 Star 0 Fork 0
Code Issues Pull Requests Actions Packages Projects Releases Wiki Activity Settings
Settings
Repository
Collaborators
Webhooks
Branches
Tags
Deploy Keys
Actions
Runners
Secrets
Variables
Runners Management (Total: 1)
Create new Runner
Search runners...
Status ID Name Version Type Labels Last Online Time Edit
Idle 1 06f073513a95 v0.2.13 Repository ubuntu-latest ubuntu-24.04 ubuntu-22.04 1 minute ago
Powered by Gitea Version: 1.22.3 Page: 36ms Template: 4ms
English Licenses API


gitea.devsecmindset.dev/Richard/final-assignment-crm/actions/runs/5
Issues
Pull Requests
Milestones
Explore
Richard / final-assignment-crm
Watch 1
Star 0
Fork 0
Code
Issues
Pull Requests
Actions
Packages
Projects
Releases
Wiki
Activity
Settings
yaml indentation issue ciorrected
build-and-push.yml: Commit 58bd071173 pushed by Nikhil main
Re-run all jobs
build-and-push 7m28s
build-and-push
Success
Set up job 10s
Checkout code 4s
Set up Docker Buildx 7s
Log in to Gitea Container Registry 4s
Build and push Docker image 6m59s
Complete job 4s
Powered by Gitea Version: 1.22.3 Page: 35ms Template: 8ms
English Licenses API


gitea.devsecmindset.dev/Nikhil/-/packages
Issues
Pull Requests
Milestones
Explore
Repositories
Projects
Packages
Public Activity
Starred Repositories
Search packages...
Type
final-assignment-crm Container
Published 1 minute ago by Nikhil
Nikhil
0 Followers · 0 Following
email@email.com
Joined on Dec 12, 2025
Powered by Gitea Version: 1.22.3 Page: 216ms Template: 51ms
English Licenses API



Step 4: Cloudflared Tunnel - Exposing CRM to Internet

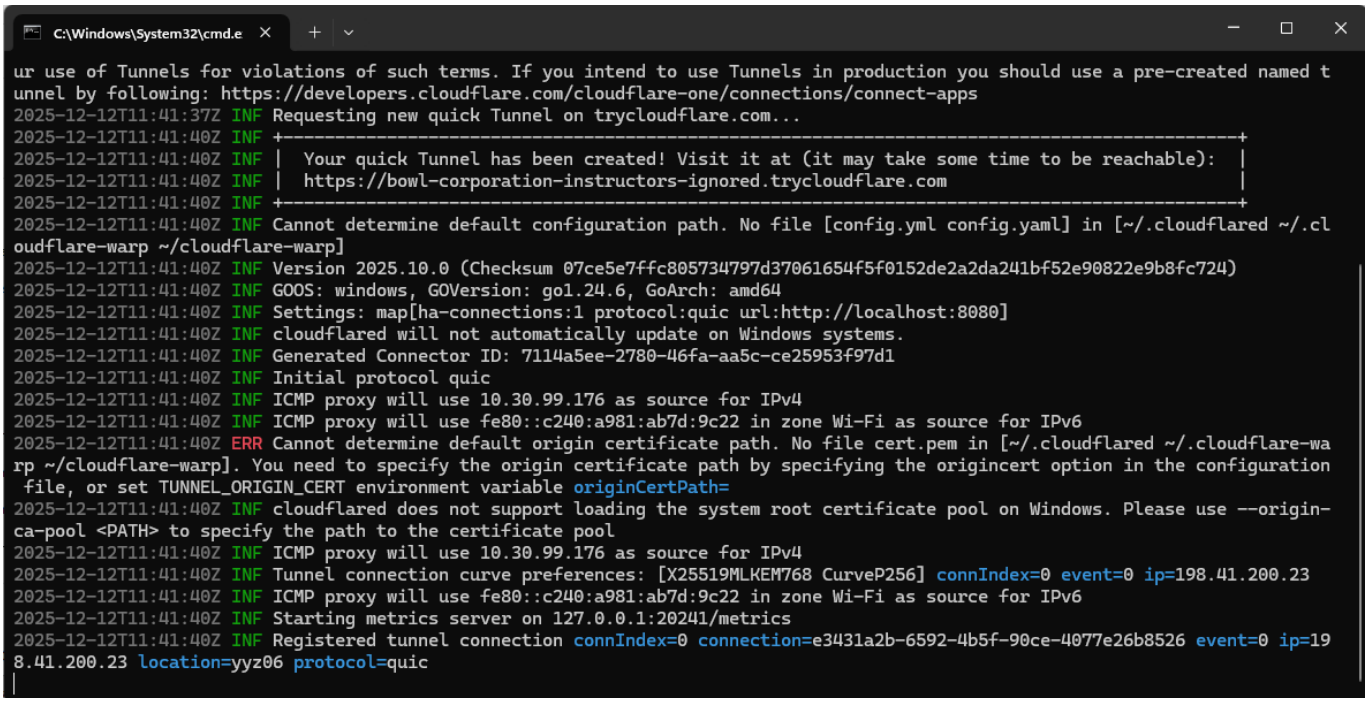
Tasks Completed:

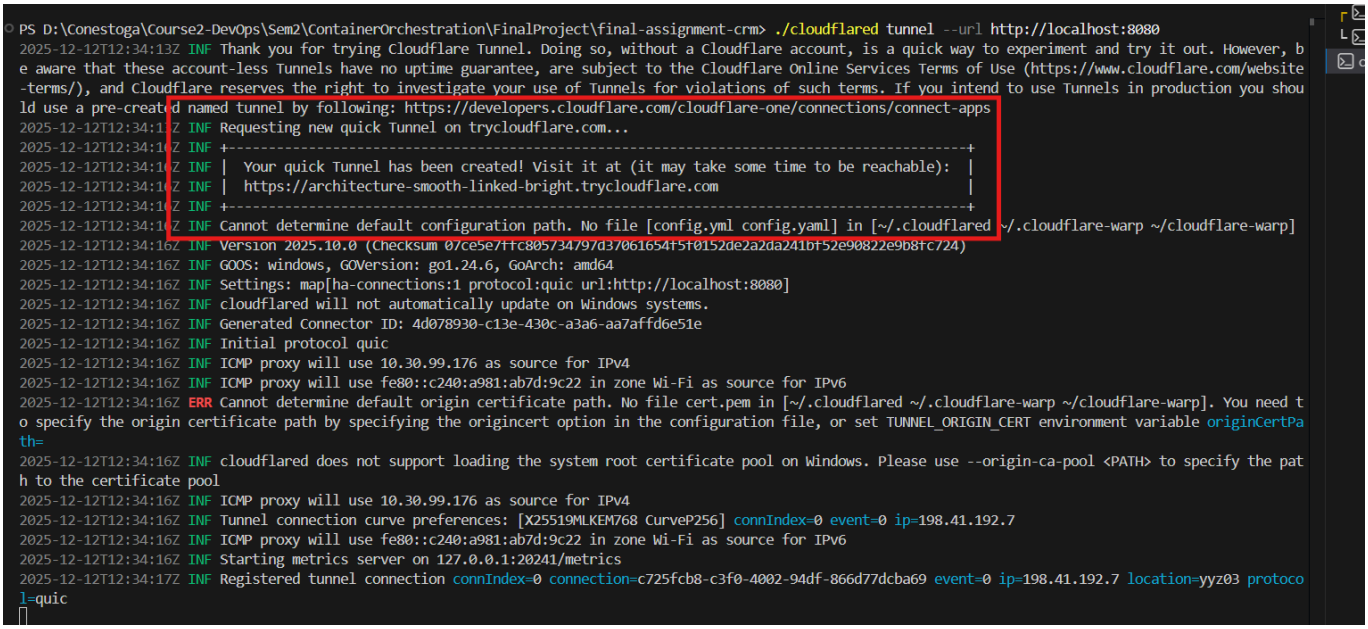
- Downloaded and installed Cloudflared CLI
- Fixed Python version compatibility issue (changed from `python:alpine` to `python:3.12-alpine`)
- Configured Django ALLOWED_HOSTS to accept Cloudflare tunnel domains
- Added CSRF_TRUSTED_ORIGINS for Cloudflare URLs
- Created cloudflared tunnel using `./cloudflared.exe tunnel --url http://localhost:8080`
- Successfully exposed CRM application to public internet via Cloudflare tunnel
- Verified public URL accessibility

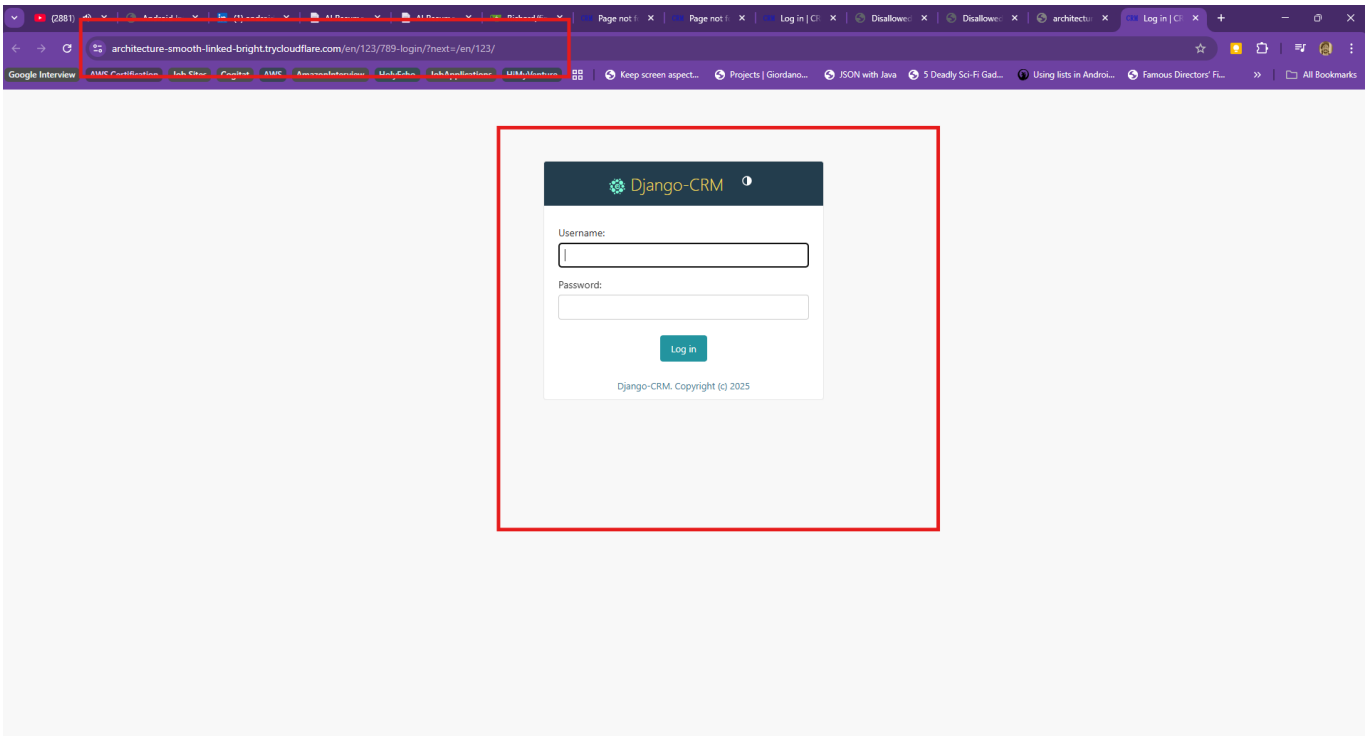
Configuration Changes:

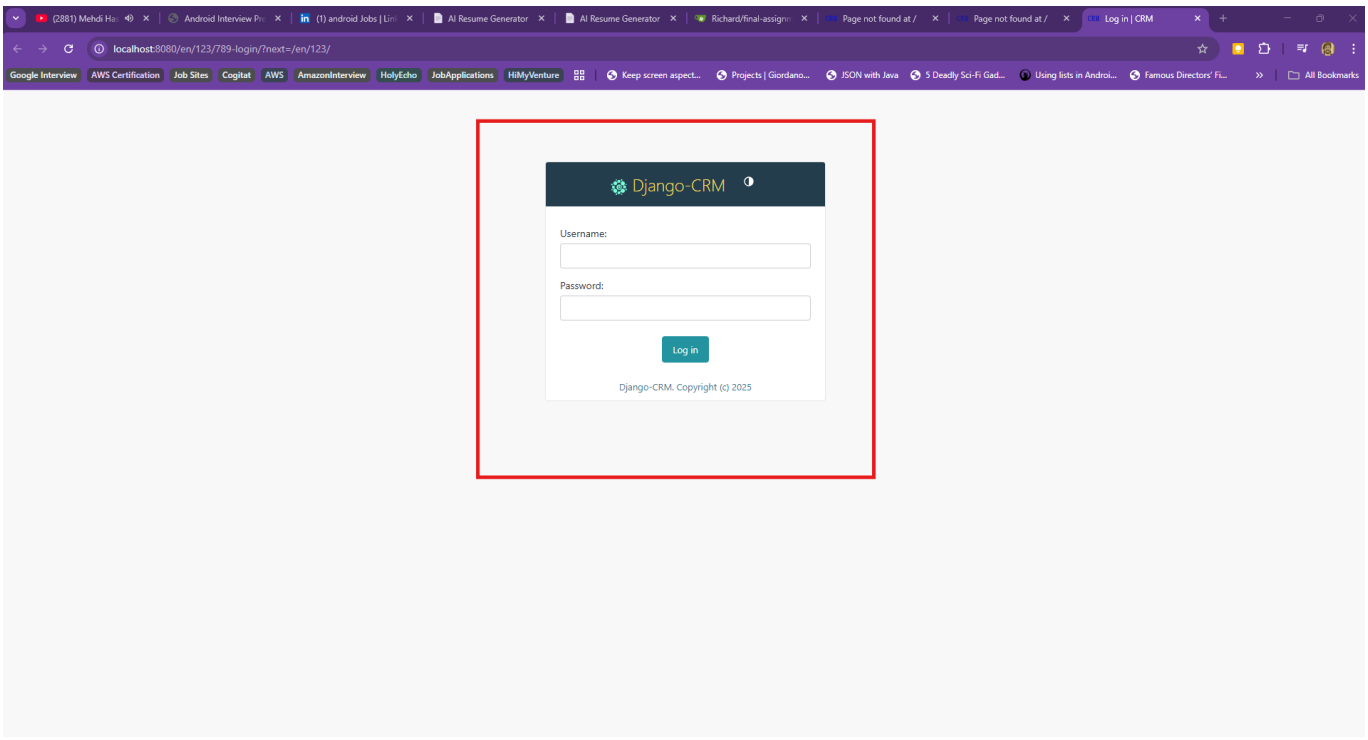
1. **Dockerfile**: Updated base image to Python 3.12 for numpy/pandas compatibility
2. **settings.py**: Added Cloudflare tunnel URLs to ALLOWED_HOSTS:
    - `anaheim-bottles-hop-delayed.trycloudflare.com`
    - `architecture-smooth-linked-bright.trycloudflare.com`
3. **urls.py**: Added root URL redirect to `/en/123/` for better user experience

Screenshots:


C:\Windows\System32\cmd.e
ur use of Tunnels for violations of such terms. If you intend to use Tunnels in production you should use a pre-created named t
unnel by following: https://developers.cloudflare.com/cloudflare-one/connections/connect-apps
2025-12-12T11:41:37Z INF Requesting new quick Tunnel on trycloudflare.com...
2025-12-12T11:41:40Z INF +
2025-12-12T11:41:40Z INF | Your quick Tunnel has been created! Visit it at (it may take some time to be reachable): |
2025-12-12T11:41:40Z INF | https://bowl-corporation-instructors-ignored.trycloudflare.com |
2025-12-12T11:41:40Z INF +
2025-12-12T11:41:40Z INF Cannot determine default configuration path. No file [config.yml config.yaml] in [~/.cloudflared ~/.cl
oudflare-warp ~/cloudflare-warp]
2025-12-12T11:41:40Z INF Version 2025.10.0 (Checksum 07ce5e7ffc805734797d37061654f5f0152de2a2da241bf52e90822e9b8fc724)
2025-12-12T11:41:40Z INF GOOS: windows, GOVersion: go1.24.6, GoArch: amd64
2025-12-12T11:41:40Z INF Settings: map[ha-connections:1 protocol:quic url:http://localhost:8080]
2025-12-12T11:41:40Z INF cloudflared will not automatically update on Windows systems.
2025-12-12T11:41:40Z INF Generated Connector ID: 7114a5ee-2780-46fa-aa5c-ce25953f97d1
2025-12-12T11:41:40Z INF Initial protocol quic
2025-12-12T11:41:40Z INF ICMP proxy will use 10.30.99.176 as source for IPv4
2025-12-12T11:41:40Z INF ICMP proxy will use fe80::c240:a981:ab7d:9c22 in zone Wi-Fi as source for IPv6
2025-12-12T11:41:40Z ERR Cannot determine default origin certificate path. No file cert.pem in [~/.cloudflared ~/.cloudflare-wa
rp ~/cloudflare-warp]. You need to specify the origin certificate path by specifying the origincert option in the configuration
file, or set TUNNEL_ORIGIN_CERT environment variable originCertPath=
2025-12-12T11:41:40Z INF cloudflared does not support loading the system root certificate pool on Windows. Please use --origin-
ca-pool <PATH> to specify the path to the certificate pool
2025-12-12T11:41:40Z INF ICMP proxy will use 10.30.99.176 as source for IPv4
2025-12-12T11:41:40Z INF Tunnel connection curve preferences: [X25519MLKEM768 CurveP256] connIndex=0 event=0 ip=198.41.200.23
2025-12-12T11:41:40Z INF ICMP proxy will use fe80::c240:a981:ab7d:9c22 in zone Wi-Fi as source for IPv6
2025-12-12T11:41:40Z INF Starting metrics server on 127.0.0.1:20241/metrics
2025-12-12T11:41:40Z INF Registered tunnel connection connIndex=0 connection=e3431a2b-6592-4b5f-90ce-4077e26b8526 event=0 ip=19
8.41.200.23 location=yyz06 protocol=quic


PS D:\Conestoga\Course2-DevOps\Sem2\ContainerOrchestration\FinalProject\final-assignment-crm> ./cloudflared tunnel --url http://localhost:8080
2025-12-12T12:34:13Z INF Thank you for trying Cloudflare Tunnel. Doing so, without a Cloudflare account, is a quick way to experiment and try it out. However, b
e aware that these account-less Tunnels have no uptime guarantee, are subject to the Cloudflare Online Services Terms of Use (https://www.cloudflare.com/website
-terms/), and Cloudflare reserves the right to investigate your use of Tunnels for violations of such terms. If you intend to use Tunnels in production you shou
ld use a pre-created named tunnel by following: https://developers.cloudflare.com/cloudflare-one/connections/connect-apps
2025-12-12T12:34:16Z INF Requesting new quick Tunnel on trycloudflare.com...
2025-12-12T12:34:16Z INF +
2025-12-12T12:34:16Z INF | Your quick Tunnel has been created! Visit it at (it may take some time to be reachable): |
2025-12-12T12:34:16Z INF | https://architecture-smooth-linked-bright.trycloudflare.com |
2025-12-12T12:34:16Z INF +
2025-12-12T12:34:16Z INF Cannot determine default configuration path. No file [config.yml config.yaml] in [~/.cloudflared ~/.cloudflare-warp ~/cloudflare-warp]
2025-12-12T12:34:16Z INF Version 2025.10.0 (Checksum 07ce5e7ffc805734797d37061654f5f0152de2a2da241bf52e90822e9b8fc724)
2025-12-12T12:34:16Z INF GOOS: windows, GOVersion: go1.24.6, GoArch: amd64
2025-12-12T12:34:16Z INF Settings: map[ha-connections:1 protocol:quic url:http://localhost:8080]
2025-12-12T12:34:16Z INF cloudflared will not automatically update on Windows systems.
2025-12-12T12:34:16Z INF Generated Connector ID: 4d078930-c13e-430c-a3a6-aa7affd6e51e
2025-12-12T12:34:16Z INF Initial protocol quic
2025-12-12T12:34:16Z INF ICMP proxy will use 10.30.99.176 as source for IPv4
2025-12-12T12:34:16Z INF ICMP proxy will use fe80::c240:a981:ab7d:9c22 in zone Wi-Fi as source for IPv6
2025-12-12T12:34:16Z ERR Cannot determine default origin certificate path. No file cert.pem in [~/.cloudflared ~/.cloudflare-warp ~/cloudflare-warp]. You need t
o specify the origin certificate path by specifying the origincert option in the configuration file, or set TUNNEL_ORIGIN_CERT environment variable originCertPa
th=
2025-12-12T12:34:16Z INF cloudflared does not support loading the system root certificate pool on Windows. Please use --origin-ca-pool <PATH> to specify the pat
h to the certificate pool
2025-12-12T12:34:16Z INF ICMP proxy will use 10.30.99.176 as source for IPv4
2025-12-12T12:34:16Z INF Tunnel connection curve preferences: [X25519MLKEM768 CurveP256] connIndex=0 event=0 ip=198.41.192.7
2025-12-12T12:34:16Z INF ICMP proxy will use fe80::c240:a981:ab7d:9c22 in zone Wi-Fi as source for IPv6
2025-12-12T12:34:16Z INF Starting metrics server on 127.0.0.1:20241/metrics
2025-12-12T12:34:17Z INF Registered tunnel connection connIndex=0 connection=c725fcb8-c3f0-4002-94df-866d77dcba69 event=0 ip=198.41.192.7 location=yyz03 protoco
l=quic





Step 5: Kubernetes Deployment with Helm

Tasks Completed:

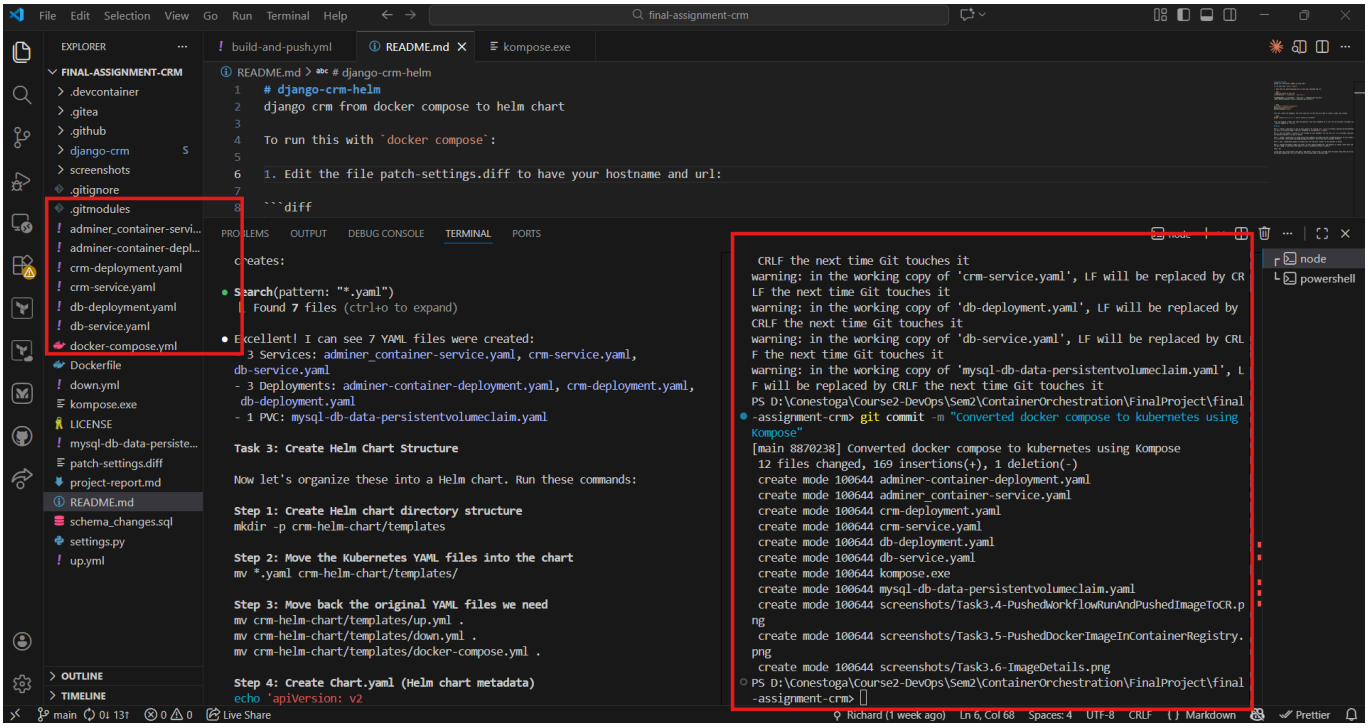
- Updated docker-compose.yml to use Gitea registry image (`gitea.devsecmindset.dev/nikhil/final-assignment-crm:latest`)
- Installed Kompose tool
- Converted docker-compose.yml to Kubernetes manifests using Kompose
- Fixed Kubernetes resource naming (replaced underscores with hyphens for DNS compliance)
- Created Helm chart structure with Chart.yaml and values.yaml
- Organized Kompose-generated manifests into `crm-helm-chart/templates/`

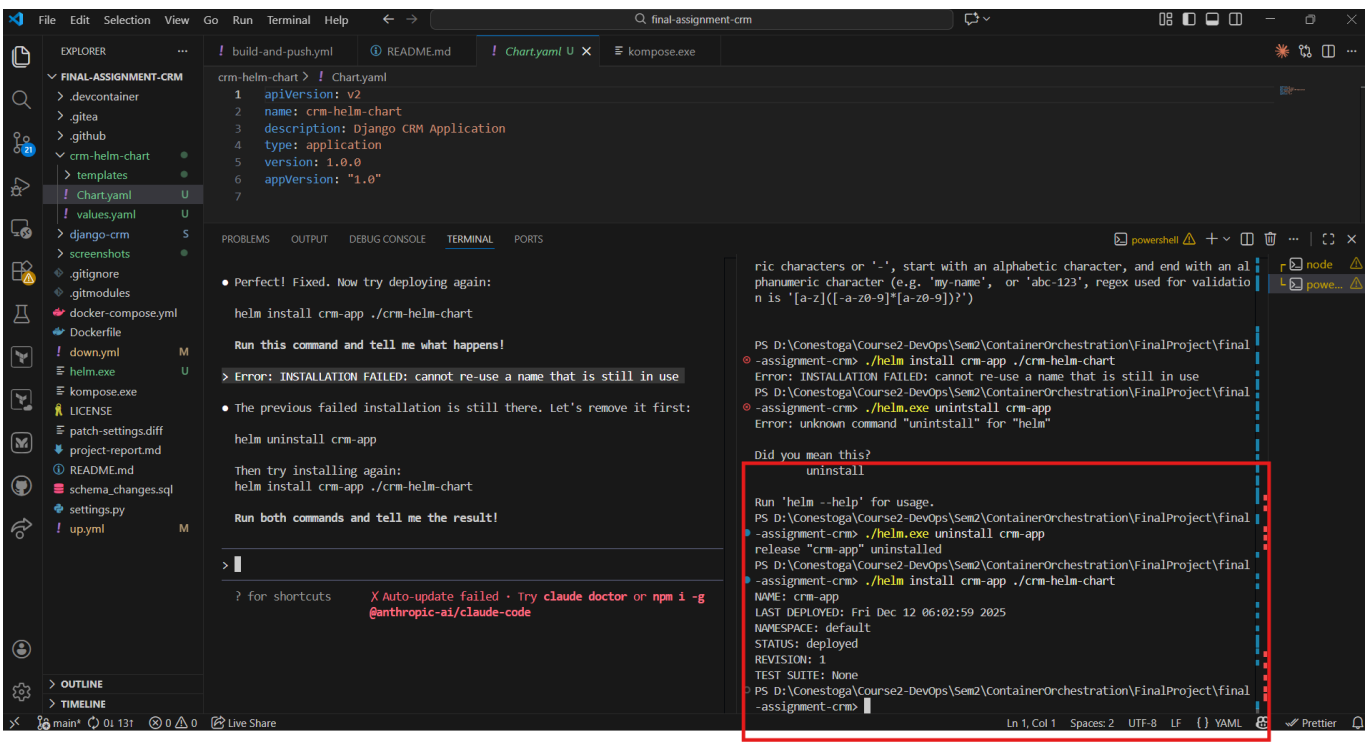
- Modified up.yaml to use Helm for Kubernetes deployment
- Modified down.yaml to use Helm for Kubernetes cleanup
- Installed Helm on local machine
- Successfully deployed application to Kubernetes cluster using `helm install crm-app ./crm-helm-chart`

Deployment Status:

- Database (MySQL) pod: Running
- Adminer pod: Running
- CRM application pod: Deployed (requires image rebuild with runtime dependencies)

Screenshots:





```
TEST SUITE: None
PS D:\Conestoga\Course2-DevOps\Sem2\ContainerOrchestration\FinalProject\final
-assignment-crm> kubectl get pods
NAME                                READY   STATUS                       RESTA
RTS      AGE
adminer-container-c484cfb6-jgwgd    1/1     Running                      0
         2m4s
cloudflared-7897557cc7-d9245        0/1     CreateContainerConfigError   0
         2m4s
crm-6b765d9587-czhst                0/1     CrashLoopBackOff             4 (25
s ago)   2m4s
db-56b6988977-6lmr9                 1/1     Running                      0
         2m4s
PS D:\Conestoga\Course2-DevOps\Sem2\ContainerOrchestration\FinalProject\final
-assignment-crm>
```

Project URLs

- **Gitea Repository**: https://gitea.devsecmindset.dev/Richard/final-assignment-crm.git
- **Public GitHub**: https://github.com/Richard-Conestoga/container-asssignment3.git
- **Gitea Instance**: https://gitea.devsecmindset.dev/
- **Container Registry**: https://gitea.devsecmindset.dev/Nikhil/-/packages/container/final-assignment-crm

---

Technologies Used

- Docker & Docker Compose
- Kubernetes (K3s)
- Helm
- Kompose
- Gitea & Gitea Actions
- Gitea Container Registry
- TrueNAS (NFS Storage)
- Cloudflared Tunnel
- Django CRM Application
- MySQL Database
- Adminer (Database Management)

Team Contributions

Richard:

- Step 1: Gitea Repository Setup
- Step 2: NFS Storage Configuration

Nikhil:

- Step 3: CI/CD Pipeline with Gitea Actions
- Step 4: Cloudflared Tunnel Configuration
- Step 5: Kubernetes Deployment with Helm