

ZAMBIAN FARMER SYSTEM - BACKEND DOCKER SETUP & DEBUG LOG

PHASE 1: BASE SETUP

1. Cloned the main repository: Module1.
2. Created backend structure under backend/app/ with FastAPI, MongoDB, Redis, and Nginx.
3. Added Dockerfile for FastAPI backend and docker-compose.yml with 4 services:
 - backend (FastAPI)
 - mongodb (MongoDB 7.0)
 - redis (Redis Alpine)
 - nginx (reverse proxy for HTTPS and static files)

PHASE 2: ENVIRONMENT CONFIGURATION

1. Set .env variables for database URIs, secret keys, and API base URLs.
2. Verified environment file loading with pydantic-settings.

PHASE 3: DOCKER BUILD AND NETWORK SETUP

1. Built all services using:
docker-compose build
 2. Started containers:
docker-compose up -d
 3. Verified healthy containers with:
docker ps --format "table {{.Names}} {{.Status}} {{.Ports}}"
 4. Checked Docker network connections with:
docker network inspect module1_farmer_network
-

PHASE 4: DEBUGGING MONGO & PYDANTIC

- Fixed database connection warnings using 'if database is None:' check.
- Updated requirements.txt for:
pydantic==2.9.2
pydantic-settings==2.6.0
email-validator==2.2.0
python-dotenv==1.0.1

PHASE 5: FIXING CRYPTO DEPENDENCY

- Installed missing module:
pip install pycryptodome
- Rebuilt image and restarted containers.

PHASE 6: FIXING NGINX CONFIGURATION

- Moved add_header directives inside the server block.
- Updated nginx/nginx.conf:
server {
 listen 80;
 add_header Access-Control-Allow-Origin *;
 add_header Access-Control-Allow-Methods "GET, POST, PUT, DELETE, OPTIONS";
 add_header Access-Control-Allow-Headers "Content-Type, Authorization";
}
- Restarted nginx container:
docker-compose restart nginx

PHASE 7: BACKEND CIRCULAR IMPORT FIX

Problem:

ImportError: cannot import name 'get_current_active_user' from partially initialized module 'app.routes.auth'

Solution:

1. Created new file backend/app/dependencies/auth_dependencies.py
2. Moved shared methods: get_current_active_user, require_role
3. Updated imports in all route files.
4. Rebuilt containers:

```
docker-compose down -v
```

```
docker-compose build --no-cache
```

```
docker-compose up -d
```

PHASE 8: HEALTH CHECK VERIFICATION

- Backend responding on /docs (Swagger UI)
- Mongo, Redis, Backend all healthy.
- Verified using:

```
docker inspect --format='{{json .State.Health}}' zambian_farmer_nginx
```

PHASE 9: API TESTING

- /api/auth/login initially returned 404.
- Route mapping verified in Swagger.
- Swagger available at:

```
https://<your-codespace-id>-8000.app.github.dev/docs
```

FINAL NOTES

- Use 'docker logs -f <container>' for debugging.

- Persistent setup:

```
docker-compose up -d --build
```

- Cleanup:

```
docker-compose down -v
```

```
docker system prune -a
```

System Status: Fully containerized & operational (backend, redis, mongodb healthy)

Pending: Frontend integration & route-level testing.