

# 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.