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Disaster Recovery & Backup Plan

This document outlines the backup and restore procedures, as well as the Disaster Recovery (DR) plan for the Local Food AI stack.

1. Backup Procedures

Given the massive 3GB+ size of the OpenFoodFacts dataset, backing up the entire MySQL data volume dynamically is resource-intensive. The strategy is split into **Code Backup** and **Data Backup**.

1.1 Source Code & App Configuration

The entire application infrastructure (Dockerfiles, Python scripts, configuration) is tracked in the Git repository. **Backup Command:** `git push origin main` *Frequency: Triggered automatically by developers after every Sprint.*

1.2 Database (MySQL) Backup

We use `mysqldump` to create a cold-standby physical backup of the user data and dietary profiles, while ignoring the massive, immutable OpenFoodFacts partition (which can be re-ingested from the source CSV).

Backup Command:

```
sudo docker exec food_project-mysql-1 mysqldump -u root -proot_pass food_db users
user_health_profiles plate_items > /backup/food_db_users_$(date +%F).sql
```

*Frequency: Daily via a server-side cron job (0 3 * * *).*

2. Restore Procedures

2.1 Database Restore (Warm Recovery)

If the database container crashes or the volumes are corrupted:

- Stop the application container to prevent write conflicts: `sudo docker-compose stop app`
- Wipe and re-initialize the MySQL container.
- Restore the user tables from the SQL dump:

```
cat /backup/food_db_users_2026-05-12.sql | sudo docker exec -i food_project-
mysql-1 mysql -u root -proot_pass food_db
```

- Restart the background ingestion script (`./data_sync.sh`) to rebuild the massive OpenFoodFacts `products_core` tables.
- Restart the application: `sudo docker-compose start app`

3. Disaster Recovery (DR) Plan

3.1 Recovery Objectives

- **Recovery Time Objective (RTO):** 4 Hours (primarily bottlenecked by the 3-hour re-ingestion time of the CSV dataset if the core tables are lost).
- **Recovery Point Objective (RPO):** 24 Hours (User profiles and plates are backed up nightly).

3.2 High Availability & Failover Strategy

If deploying in the distributed Multi-Hypervisor PoC environment (Hyper-V / VirtualBox / WSL):

- **Ollama Node Failure:** The `app` is engineered to gracefully catch LLM connection timeouts. If the VirtualBox Ollama node dies, the Streamlit app will continue to function for standard Database lookups, returning a safe fallback message for AI evaluations.
- **Zabbix Node Failure:** The SNMP daemons run autonomously in each container. If the Zabbix telemetry server goes offline, the containers will safely drop the UDP traps without bottlenecking application performance.

3.3 Network/Server Disconnect & Local Fallback Mode

When the network to the remote host VM (`192.168.130.170`) or the Taiga server (`192.168.130.161`) is unavailable:

- **Resilient Single-Node Local Fallback:** The entire stack is completely containerized. By running `docker compose up -d` at the root of the workspace, MySQL, Ollama (with Llama 3.2:3B), SearXNG, Zabbix (Server, Web, Agent), Nginx, and the Streamlit App run entirely locally on the same host, avoiding external network dependencies.
- **Taiga Sync Bypass:** The `taiga_sync_final.py` execution is decoupled from core runtime. In disconnected mode, commits and user stories are managed through local Git branch state and manual tasks/walkthroughs, and sync scripts can be run once the connection is restored.
- **Dynamic Configuration Resolvers:** The application components, database migrations (`alembic/env.py`), and SNMP notification wrappers (`snmp_notifier.py`, `configure_zabbix_alerts.py`) automatically detect the local environment or fall back to container names (e.g. `mysql`, `zabbix-server`) rather than crashing on unreachable remote IPs.