Guidebook (Step-by-Step Manual)

Linux Project 3-Tier Project Guide :

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Project: Frontend + Backend + Database with NGINX, Flask, and MariaDB, Zabbix (In Progress)

◆ Project Overview

This project demonstrates a simple **3-tier application**:

- **Frontend VM (NGINX + HTML/JS)** → serves the UI.

- **Backend VM (Flask + Gunicorn + NGINX)** → serves API and connects to DB.

- **Database VM (MariaDB)** → stores user data.

Step 1 - VM Setup

Prepare 3 Ubuntu-based VMs:

- frontend-vm → serves static HTML (port 80)

- backend-vm → Flask + Gunicorn behind NGINX (port 80 proxy → 5000 app)

- db-vm → MariaDB (port 3306)

Make sure all VMs can resolve each other by hostname (frontend-vm, backend-vm, db-vm)
or **update /etc/hosts**

Step 2 - Packages Needed

Frontend VM

    nginx - openssh-server

Backend VM

    Nginx - python3 - python3-pip - python3-venv - openssh-server

    flask - mysql-connector-python - flask-cors – gunicorn

Database VM

    mariadb-server - git - openssh-server

Step 3 - Database Setup

- Log in to MariaDB
- Run init.sql
- Allow traffic from backend VM
- Test from DB VM & Backend VM

Step 4 - Backend Setup

- Create project environment
- Save app.py and test
- Create Gunicorn service
- Configure NGINX
- Test from Backend VM

Step 5 – Frontend Setup

- Place index.html under /home/user/frontend_project/
- Configure NGINX
- Test from Frontend VM

Kindly contact me if you have a question or need further clarification at :

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