Proposal - Type I Product Management System

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Introduction:

Background:

The project I designed is the **Product Management System**, which can help authorized staff to manage all the products on the website.

In the product management system, authorized staff can add new products, delete, edit, and search existing products after logging in. For the customers, they can see all the latest product information in the product page.

This management website can be accessed from both **PC** and **mobile devices**, which helps staff manage the products more conveniently.

Features / Functions:

Support both PC and mobile devices: The jQuery Mobile framework is used in the front-end, which supports both PC and mobile device browsers.

Log in / Log out: The authorized staff should input their username and password to log in the management system before managing products. All the authorized username and password are stored in the database.

Product search: The authorized staff can search products by their ID/name/type, then all the relevant products will be retrieved from the database.

Product addition: The authorized staff can add products into the system. The input information and image will be checked before uploading into the database.

Product update: The authorized staff can edit existing products information in the system. The updated information and image will be checked before uploading into the database.

Product deletion: The authorized staff can delete products from the database, the system will ask for your confirmation before deleting.

Product page: The customers can see the latest products information on the product page. All the product information is retrieved from the database.

Benefits from cloud computing:

Cost saving:

The project is deployed on the Google Cloud Platform. No physical hardware cost needed.

Fast deployment:

By using the docker-compose technique, all the services can be containerized and deployed within a few minutes.

Scalability and Reliability:

By using the Swarm technique, we can manage a cluster of nodes and schedule containers flexibly. For example, we can scale up Nginx service when the access increases.

Swarm also improves reliability. For example, the outage of one worker node will not affect the running of the website because the services will be immediately migrated to other active nodes.

Technical Solution:

Front-end / Back-end technologies:

HTML & CSS & JavaScript: Design the website interface and user interactive

jQuery Mobile framework: Fit both PC and mobile device browsers

Php: Connect to the database and process the data retrieval and display, etc.

SQL: Operate the database

Estimated cost:

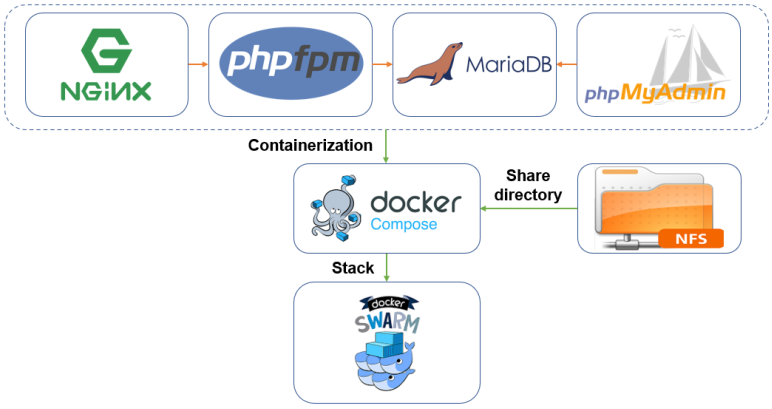
There are **1 manager node (n1-standard-2)** and **2 worker nodes(n1-standard-1)** in my project. According to Google Cloud Pricing Calculator, if all of them run 24 hours/day, 7 days/week, it will take 97.08 USD/month.

Additionally, there are **1*100G** and **2*10G** persistent disks in my project. According to Google Cloud Pricing Calculator, it will take 4.8 USD/month. This cost will also increase as the disk size expanded.

Therefore, the total cost for my current project is approximately **100 USD/month**.

Architecture Design:

Workflow figure:



Architecture:

Nginx: Webserver to process requests

phpfpm: Assist Nginx to process php file requests

MariaDB: Relational database to store information and process SQL query

phpMyAdmin: A tool to administrate MariaDB

All above four services will be containerized by docker-compose. Additionally, the website root folder will be exposed to all nodes and mounted as NFS volume in the docker-compose file.

Docker swarm will be created on the manager node and the other 2 nodes will be added as worker nodes into swarm. After finishing the swarm setting, all four services will be deployed as a stack to the swarm and the website can successfully run.