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S103 Project Report

BUT Informatique

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S103 Project Report

Summary

This comprehensive report details the installation and configuration of a Raspberry Pi with a MariaDB database in the S103-MariaDB project. It covers key steps, challenges faced, and successful outcomes achieved throughout the process.

The report emphasizes the purpose, methodology, and sources utilized, providing insights into the integration of Raspberry Pi and MariaDB. Notable achievements include the successful setup of the Raspberry Pi, installation of MariaDB, SQL database creation, and system time configuration.

The report concludes with a discussion of skills acquired and potential areas for future enhancements, emphasizing the project's value in Raspberry Pi and MariaDB integration.

1 Table des matières

2 Introduction

The S103-MariaDB project focuses on the installation and configuration of a Raspberry Pi with a MariaDB database. This report provides a comprehensive overview of the key steps undertaken during the project.

2.1 Background

The Raspberry Pi serves as a versatile and cost-effective platform for various applications. In this project, we aim to leverage its capabilities to set up a MariaDB database system.

2.2 Purpose

The primary purpose of the project is to establish a functional Raspberry Pi system with MariaDB, demonstrating the ability to manage a database on this platform.

2.3 Method

The project involves a step-by-step approach, including initial Raspberry Pi setup, MariaDB installation, SQL database creation, and thorough documentation. Utilizing SSH and Python scripts facilitates testing and validation.

2.4 Discussion of Sources

The main sources of information include the official Raspberry Pi documentation, MariaDB documentation, community forums, and ChatGPT assistance. Critical evaluation of online sources is essential to ensure reliable guidance.

3 Results

3.1 Raspberry Pi Setup

- Successfully burned the RaspiOS image onto the microSD card using Raspberry Pi Imager.
- Created the 'student' user and activated the SSH service.
- Configured the SSH service for remote access.

3.2 MariaDB Installation and Configuration

- Installed MariaDB server using apt-get.
- Enabled external connections to the MariaDB service.
- Encountered difficulties connecting to the 'prof' user – further investigation needed.
- Executed SQL commands to create the 'CAMPING' database, user 'prof,' and associated tables.
- Verified MariaDB service activation and accessibility .

3.3 System Time Configuration

- Adjusted the Raspberry Pi system time using NTP for accurate synchronization.
- Implemented manual time adjustment as a fallback measure.

4 Discussion of Results

The project progressed smoothly through various stages, achieving successful outcomes in most aspects. The Raspberry Pi was effectively set up, and the MariaDB installation and configuration were executed without major issues. System time configuration, including NTP synchronization, was performed seamlessly.

However, one notable challenge arose during the attempt to connect as the 'prof' user. Despite creating the user and setting the password, we encountered difficulties granting the necessary privileges for successful authentication.

In conclusion, while the majority of the project tasks were accomplished successfully, the challenge in configuring 'prof' user privileges highlighted a potential area for improvement. A thorough investigation and resolution of this issue will contribute to achieving a fully functional MariaDB setup on the Raspberry Pi.

5 Appendix

5.1 Creation des Tables (SQL)

- SQL queries for creating tables in the 'CAMPING' database:

```
CREATE TABLE CAMPING (
    NumCamping INT PRIMARY KEY,
    NomCamping VARCHAR(255),
    AddrCamping VARCHAR(255),
    TelCamping VARCHAR(20),
    DateOuv DATE,
    DateFerm DATE,
```

```
    NbEtoiles INT,
    QualiteFrance VARCHAR(50)
);

CREATE TABLE ACTIVITE (
    NumActivite INT PRIMARY KEY,
    NomActivite VARCHAR(255),
    TypeActivite VARCHAR(50)
);

CREATE TABLE ACTICAMPING (
    NumCamping INT,
    NumActivite INT,
    PrixActivite DECIMAL(10, 2),
    PRIMARY KEY (NumCamping, NumActivite),
    FOREIGN KEY (NumCamping) REFERENCES CAMPING(NumCamping),
    FOREIGN KEY (NumActivite) REFERENCES ACTIVITE(NumActivite)
) ;
```

5.2 Insertion des Données (SQL)

- SQL queries for inserting data into tables in the 'CAMPING' database:

```
-- Insertion dans la table CAMPING
INSERT INTO CAMPING (NumCamping, NomCamping, AddrCamping, TelCamping, Da-
teOuv, DateFerm, NbEtoiles, QualiteFrance)
VALUES
    (1, 'Le Paradis', '123 Rue de la Forêt', '01 23 45 67 89', '2023-05-01',
'2023-10-31', 4, 'Excellente'),
    (2, 'Belle Nature', '456 Avenue des Montagnes', '98 76 54 32 10', '2023-
06-15', '2023-09-30', 3, 'Bonne');

-- Insertion dans la table ACTIVITE
INSERT INTO ACTIVITE (NumActivite, NomActivite, TypeActivite)
VALUES
    (101, 'Randonnée pédestre', 'Plein air'),
    (102, 'Escalade', 'Aventure'),
    (103, 'Yoga', 'Bien-être');

-- Insertion dans la table ACTICAMPING
INSERT INTO ACTICAMPING (NumCamping, NumActivite, PrixActivite)
VALUES
    (1, 101, 20.50),
    (1, 102, 15.75),
    (2, 101, 18.00);
```

5.3 Test Python Script

- Executed the Python script (`script.py`) to test project progress, checking network connectivity, reading student information, and executing MySQL commands remotely.

5.4 Further Steps

- **Raspberry Pi Setup**
  1. Ensure Raspberry Pi 400 is off.
  2. Insert the blank SD card.
  3. Power on the Raspberry Pi.
  4. Download Raspbian from the official site.
  5. Flash the SD card with the OS image.
  6. Initial configuration on first boot.
- **Installation of MariaDB**
  1. Open the terminal.
  2. Install MariaDB using `sudo apt-get update` and `sudo apt-get install mariadb-server`
- **System Time Configuration**
  1. Open the Terminal.
  2. Update the package list.
  3. Install the NTP package with `sudo apt-get install -y ntp`
  4. Restart the NTP service with `sudo systemctl restart ntp`.
  5. Check synchronization with `ntpq -p`.
  6. Manual adjustment if needed with `sudo timedatectl set-time '2024-01-22 16:34:00'`.

6 Conclusion

This project has provided valuable insights into Raspberry Pi and MariaDB integration. The documented steps and test script lay the foundation for potential automation and scalability. Acknowledging the obtained knowledge and acquired skills is crucial for continuous improvement.

7 Skills Acquired

1. **Raspberry Pi Configuration:** Proficient in setting up and configuring a Raspberry Pi for various applications.

2. **MariaDB Installation:** Competence in installing and configuring MariaDB on a Linux-based system.
3. **SQL Database Management:** Skills in creating databases, tables, and managing data using SQL commands.
4. **System Time Configuration:** Ability to synchronize and adjust system time on a Raspberry Pi.
5. **Remote Access and SSH:** Proficiency in configuring and utilizing SSH for remote access.
6. **Documentation:** Skillful documentation of project steps and commands using Markdown.
7. **Testing with Python:** Competence in developing Python scripts for testing and validation.