浙江大学

本科实验报告

课程名称：　　　B/S 体系软件设计

姓　　名：　　　陈忆杭

学　　院：　　　计算机科学与技术学院

专　　业：　　　计算机科学与技术

学　　号：　　　3210103981

指导教师：　　　胡晓军老师

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1 Overview

On this IoT management web platform, users can effectively manage their IoT devices on the visualization interface.

This document is the system design document of the project, including the requirement analysis of the system, the overall architecture design of the system, the design of the database and the design of the system interface.

2 Requirement Analysis

2.1 User Information Management

To access the IoT device information on this platform, users need to log in to their accounts, and the following functions are offered to users to help manage their accounts:

➢ Register

➢ Log in

➢ Modification of user information

2.2 IoT Device Management

Users are divided into normal users and administrators. The administrators are authorized to access all the information on the server to better manage the platform, while the normal users can only access their own devices and the devices whose owners authorize them to access. The following functions are offered to users to help manage their devices:

➢ Check the location of the device, visualized on a map

➢ Check the statistics of the device, including the total number of devices, current devices online and the amount of received data

➢ Modification of the device configuration, including the device ID, name and type

# 3 System Architecture

3.1 Technology Selection

The project adopts the Web development technology of front-end and back-end separation, implementing a series of RESTful style API in the back-end for the front-end to call, and a MQTT server independent of the front and back-end to receive the data sent by the simulation client and store them in the database. The technology selection of the whole project

is as follows:

➢ Front-End: vue, Google Map API

➢ Back-End: gin framework of Golang

➢ Database: MySQL

➢ MQTT server: mosquitto

3.2 System Architecture Diagram

The system architecture is shown in the following figure, in which the client side supports PC and cell phone access, and the server side consists mainly of a back-end server and an MQTT server, which interact with the database separately. The back-end server can deal with HTTP requests sent by the web page, and the MQTT can process messages sent by the device.
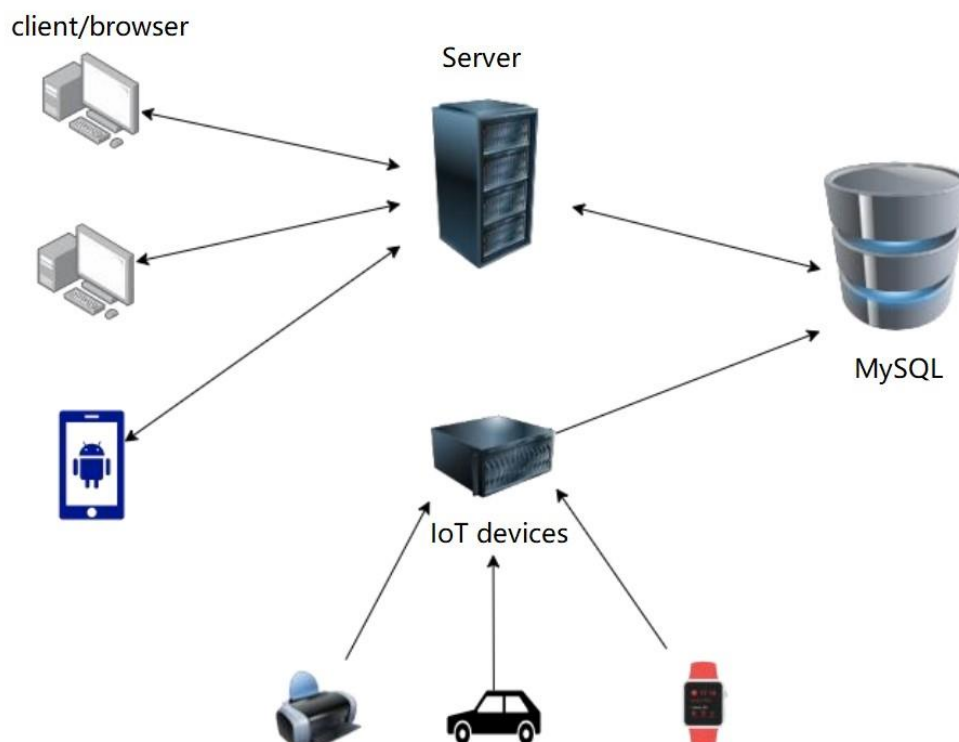
4 Database Design

The database stores the information of the users, devices and the MQTT messages.

➢ User Table

Field Name	Data Type	Description
id	INT	User ID, the primary key
username	VARCHAR(128)	Username, can duplicate
password	VARCHAR(128)	Password used by the user to log in
email	VARCHAR(128)	Email address of the user
phone	VARCHAR(128)	Phone number of the user

➢ Device Table

Field Name	Data Type	Description
id	INT	Device ID, the primary key
name	VARCHAR(128)	Device name, unique
description	VARCHAR(128)	Description of the device
user_id	INT	The device owner's user ID
category	INT	Categorize devices for statistics
last_active	VARCHAR(128)	The device's last active time

➢ Message Table

Field Name	Data Type	Description
device	INT	Device ID, the foreign key
alert	INT	Whether triggered an alert
msg	VARCHAR(128)	Message content
lat	NUMERIC	Latitude
lng	NUMERIC	Longitude
timestamp	TIMESTAMP	Time when the message is sent

5 Conclusion

The requirements analysis and the wholistic architecture of the project is temporarily defined as explained above. During the process of implementation, the details may be modified to some extent.