

Date 2025/01/26

Create presentation slides of our 1 st presentation and have meeting and discuss our goals and our each members responsibilities and try to learn about hardware components and further discuss about next few days our plan about our projects

Date 2025/01/16

ESP32 Projects: Innovation with Versatile Microcontroller Technology

ESP32 is an advanced microcontroller that has gained significant popularity in the maker and developer communities due to its versatility and wide range of applications. As part of my research into microcontrollers, I have explored the capabilities of the ESP32 and its integration into various projects, including IoT devices, home automation systems, and wearable tech. The ESP32 stands out due to its built-in Wi-Fi and Bluetooth capabilities, allowing for seamless communication and remote control. Through my hands-on experience, I have developed projects like smart thermostats, automated lighting systems, and sensor-based monitoring systems, all powered by the ESP32. This microcontroller's dual-core processor, low power consumption, and robust performance make it ideal for real-time applications and embedded systems. In my portfolio, I showcase these projects, highlighting not only the technical skills in programming and hardware interfacing but also the creative process of bringing concepts to life using the ESP32 platform.

Research on Microcontrollers

Microcontrollers are the backbone of modern electronics, powering everything from household appliances to cutting-edge robotics. Through my research, I have gained a deep understanding of various microcontrollers, their architectures, and their respective applications. By comparing different options like the Arduino, Raspberry Pi, and ESP32, I have developed a strong foundation in selecting the appropriate microcontroller for specific project needs. This research has expanded my knowledge of factors like processing power, input/output capabilities, connectivity options, and energy efficiency—essential components when designing both simple and complex embedded systems. With this knowledge, I am able to execute projects with a more comprehensive approach, ensuring optimal functionality and performance.

Date :2025/01/15

our hardware components we have ordered ,we got today





Date :2025/01/13

Do researches of Hardware components Watch several videos and try some simulators how those components works, <https://youtu.be/rEDtVMuueqI>

https://youtu.be/Nj_6YyKQG4

further analysis the hardware are collaborate with each other try to design the our product briefly

Sensor

Connection
is entered.

Micro
Controller

Same
connection?

Controller



220V

Priac based

AC dimmer

may be the
solution.

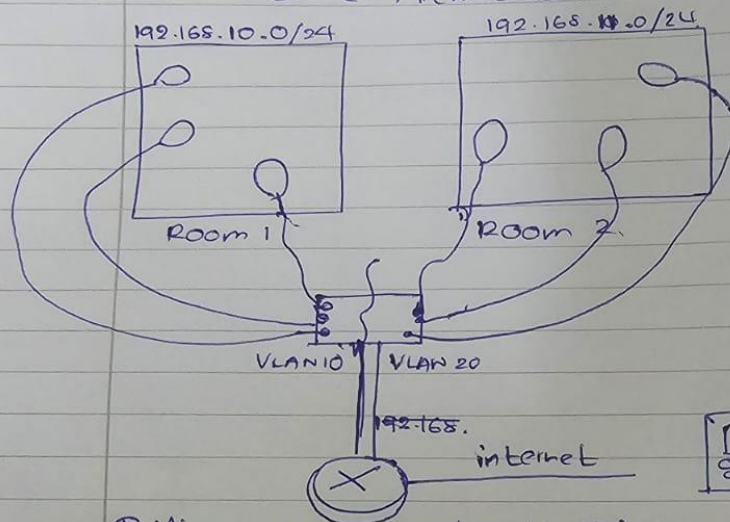
Date : 2025/01/09

Research on VLANs (Virtual Local Area Networks) VLANs are a networking technology that allows the segmentation of a physical network into multiple logical networks. This helps improve network efficiency, security, and management by isolating traffic into separate broadcast domains, even if they are connected to the same physical infrastructure. Key Components of VLANs Switches: The devices responsible for creating VLANs by grouping ports and managing traffic. Routers: Facilitate communication between different VLANs. Access Points: Provide wireless connectivity for devices within a VLAN. Network Interface Cards (NICs): Enable devices to connect to the network and support VLAN tagging. Working Principle VLANs function by assigning specific devices or ports to certain groups (VLANs), and only those devices within the same VLAN can communicate with each other directly. Routers are used to enable communication between VLANs. Each VLAN is identified by a unique VLAN ID, ensuring that traffic is correctly routed and separated. Types of VLANs Data VLANs: Dedicated to user data, isolating traffic for better security and efficiency. Voice VLANs: Used for VoIP (Voice over IP) communication, ensuring high-quality voice traffic. Management VLANs: Used to manage network devices like switches and routers, ensuring security and control. Default VLAN: Typically used for devices that are not assigned to a specific VLAN. Factors to Consider for VLAN Design Network Size: The number of devices and the required level of segmentation. Traffic Patterns: Understanding the types of traffic (data, voice, etc.) to ensure proper VLAN assignment. Security Requirements: Segregating sensitive data traffic from general user traffic to enhance security. Scalability: Ensuring the VLAN setup can grow with the network's future needs. Both hardware components in security systems and VLANs play essential roles in modern networks and security infrastructure. By understanding the key components, working principles, and considerations for selection, organizations can ensure they build robust, secure, and efficient systems to meet their specific needs.

DATE: 2025/01/04

NO:

Basic Architecture



- ④ We use separate VLAN to reduce traffic and efficient communication
- ④ router makes communication between 2 VLANs and give to chance that network via Internet
- ④ using VLANs ~~reduces~~ reduces traffics, optimize bandwidth usage, and we ~~don't~~ required more physical devices because we doing it virtually

DataBase Schema:

1) Users collection,

```
{ "id":  
  "username":  
  "email":  
  "password":  
  "phone-number":  
  "address":  
  "created-at": }
```

2) Schedules/planes

```
{ "id":  
  "device-id":  
  "user-id":  
  "start-time":  
  "end-time":  
  "repeat-day":  
  "color":  
  "brightness":  
  "status": }
```

3) Devices collection,

```
{ "id":  
  "device-name":  
  "device-type":  
  "location":  
  "user-id":  
  "status":  
  "brightness-level":  
  "colour":  
  "connected-at": }
```

4) Logs collection

```
{ "id":  
  "device-id":  
  "user-id":  
  "action":  
  "timestamp":  
  "details": }
```

5) Rooms collection

```
{ "id":  
  "user-id":  
  "room-name":  
  "devices":  
  "created-at": }
```