

Review on Server room access control using IoT

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Abstract - Internet of Things (IoT) is an extensive network of connected components working in unison by coordinating, acknowledging and sharing the resources in the network. Smart frameworks provide an optimal ambient environment for the occupants in smart homes, offices and surrounding environment. The proposed smart home framework incorporates multiple heterogeneous devices that communicate with each other and establish a collaborative network. In this framework, the server accepts incoming requests from connected devices and support interoperability across the connected devices. Simulation for IoT Smart Home includes components such as the centralized server, home security, smart phones, smart thermostat, centralized air condition, connected lights, windows and ventilation control, smart TV and smart fridge. Smart home simulations based device initialization (between server and device), data exchange sequence, module log and event log are given in the proposed framework.

Key Words: Smart Home, Energy efficient smart buildings, secure smart home, Multi-device smart home, smart locks, smart office.

1. INTRODUCTION

Internet of Things (IoT) connected to sensors, smart devices, actuators, RFIDs, laptops, PDAs and mobile phones to share the network resources and work in combination with each other. The device collaboration and synchronization is depending on physical network, virtual networks via the internet and related cloud database servers. Software defined architectures design the devices such as smart phones, and home security systems across the virtual networks and cloud database servers. This technology helps in security management systems for real-world applications. Multi-layer IoT architecture supports the concept lightweight access to smart devices, a high degree of device usability, remote monitoring of embedded devices and smart IoT network management. Developing smart IoT frameworks extend the idea of context-awareness and social group network experiment to coordinate with multi-utility users, share the resources. The smart framework decides high-level functionality that monitors the user mobility patterns and secures the privacy and integrity of user data.

This further considers new device synchronization with family members of the house. The role of smart server environment improves the framework features and

resource sharing directed by the centralized controller device.

The proposed framework for IoT smart system includes the centralized database server that verifies the authenticity of smart devices, monitors. The centralized server defines the functional attributes of each device based on device specifications, priority, and energy resource. The proposed model represents the smart devices interact with each other using synchronization methods.

2. THE CONCEPT OF SMART-LOCK-SYSTEM

In large apartment, buildings or even for an owner having many keys for each and every apartment, car, or gate, maintaining entry to authorized persons is a problem. The use of keyless entry will tackle all of these problems, but adds some additional improvement features. With the popularity of smart phone and the Internet, the smart technology is also growing fast. To improve the quality of life, many models for smart system have been proposed.

The house-door is an important and essential part of any smart system, because the door must be simple and easy to be used by anyone, and secure enough to work well and stop unwanted access to the house. While discussing how the lock works, we must realize that we are living in a world where our smart phones maybe have more information.[1].

Because of that reason, SLS takes advantages of the fact that it is easier to misplace keys than to lose our phone. Also some phones are now more secure than ever, it is possible to use a standard AES encryption that is very hard or prevent to entry into system.

Smart Lock replaces the regular key lock with a digital in keychain, and replaces physical keys with digital keys. The advantage behind a digital keychain is that you don't have to carry it around. Digital keys can be renewed anytime and updated from owner devices, this can save time compared to mechanically copying keys and carrying them around.[2]

3. Architectural Design

It specifies the design that is used to solve the problem of system's security.

A. System Parts

The Smart-Lock-System consists mainly of three major parts.

Part 1:

Door lock controller: It control the door lock and keep lock until any authorized commands are not given.

Part 2:

Central Control: It is main part of system. It reads the commands, locks, unlocks the door and executes many other operations. It interacts with smart phone for transferring information to system.

Part 3:

Mobile Application: The SLS mobile application is the software that can control the system. The mobile application provides additional useful tools to the owner, such as creating different keys for family member and guest, friends.

B. System Operation

Brief system architecture is shown in the Figure 3.1.[2]

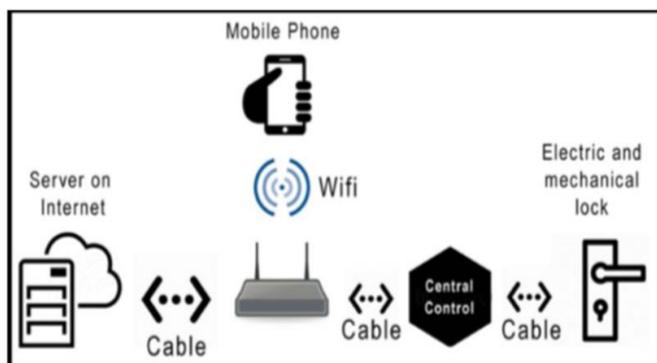


Figure 3.1: System Architecture

The system should be connected to the network (LAN) via a UTP cable. Also, the user must be on the same network in order to control the system.

Mobile Phone to Router:

The user's smart phone must be connected to the network in LAN. When connection establish, the user can now send commands to the system only using the mobile application in their smart phone.

Here commands are sent via Wifi (Packets of bits) and routed by the router to the receiver i.e. the Central Control.[4]

Central Control receives the command packets, assembles them with an Ethernet Module — then decides whether to act or not on the command.

Router to Server on the Internet: Any command sent to the Central Control will be sent to the Smart Lock server, and then notification is generated. Important action or event activity notification can be forwarded to the owner via APN Notification, Email or Text message.

C. Requirements for Operation

The first and most essential part for SLS is the Local Area Network (LAN) formed by a Network device.

Now having the base structure for our system, the next essential part is power, or power availability at all times.

D. System Execution

Firstly, we have install apk file in user's smart mobile. Through internet, user and user's wifi for interface for locking and unlocking the smart lock.

Startup:

1. Open the app and register or allow access to user you want.
2. While locking and unlocking the door, mobile (smart phone) and central control device in LAN.
3. Grant access form owner or administrator.
4. Change security code between smart phone and central control device.
5. Lock and unlock the door using smart phone.
6. Provide access register user upto limit specified by Owner.

4. SECURITY

All digital keychains and digital keys are stored on the owner's mobile phone, and can only be accessed from this phone. Nowadays, every phone company follows standard encryption protocols, where the mobile phone is completely encrypted for security when locked. Security provided by encoding and decoding by performing AES and Hashid methods.[2]

5. APPLICABILITY

There is a wide range of applicability to this system. It can be applied on home front doors, but also on gates, cars, resorts with many locked areas and so on.

6. MOBILE APPLICATION

The only way to control SLS is via the SLS mobile application. SLS-App will contact directly the system to the network device of system to unlock/lock the door.

User login authentication is required like Username and Password. They are kept on the device encrypted by the owner's mobile phone password.

CONCLUSIONS:

In conclusion, the Smart-Lock-System will open the door leading to a wide range of innovations in the world of lock systems. The system has monitoring and controlling capabilities and the network can be reachable over Internet access and via smart phone application.

The system designed at low cost since high quality equipment's are used for building the system.

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