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BAHRIA UNIVERSITY KARACHI CAMPUS

DATA COMMUNICATION & NETWORKING LAB

PROJECT REPORT

SPRING - 2023

SMOKE DETECTION AND FIRE PERVENTION

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SUBMITTED ON

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1. ABSTRACT:

Fire is the major cause of accidents claiming valuable lives and property. Smoke detectors play an important role in a fire prevention management program. Timely detection of the fireplace is vital for avoiding a serious accident. In this project, a Fire prevention and Smoke detection system is developed. It can sense smoke and the rise in temperature and alert the user by activating the siren and also send commands on the virtual terminal of the android phone through the Wi-Fi module. Fire hazards are not uncommon. To avoid injury from fire accidents, smoke detectors are put in high-security places. The hardware used is home Gateway, Switches, Smoke detectors, Fire sprinklers, Smoke sensor, Wi-Fi Module, and Siren. Software used Home Gateway for mobile applications. These smoke sensors detect smoke because the fire break associated invokes an early alarm. This way, before the fire spreads to different components of the building, people can be evacuated and countermeasures can be done immediately. The detection system operates as a fire detector and smoke detector sensor. In this, we discuss the design and implementation of a smoke detection system using the Home Gateway which operates the entire system.

2. INTRODUCTION:

Home fire detection is a matter of great concern, and thus many efforts are devoted in most developed countries to the design of automatic detection systems. A fire prevention system should reliably and in a timely way notify building occupants about the presence of fire indicators, such as smoke or high temperatures. A fire detector is usually implemented as a smoke sensor due to its early fire detection capability, fast response time, and relatively low cost. Other options for fire detection are based on gas sensors or temperature sensors fire detectors that use a single sensor, generally a smoke sensor, and present high false-siren rates due to temperature changes.

3. LITERATURE REVIEW

This paper is to design and implement an automatic fire and smoke detection and prevention system that can be produced at a low cost with effective and competitive usage. This System is designed to be more user-friendly and easy to operate at any level. The creation of faster evacuation technologies and safer living conditions at an affordable cost for everyone. This paper discusses the automatic fire detection system, composition, and working principle. The overall structure of the fire detection system and control software in the design. Low-cost fire detection and control system based on smoke detection is proposed. It is a combination of electrical devices working together to detect the presence of fire and alert people. These sirens may be activated from smoke detectors which, when detected, smoke.

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4. COMPONENTS / TOOLS:

1) Smoke detectors

2) Fire sprinkler

3) Windows

4) Doors

5) Garage door

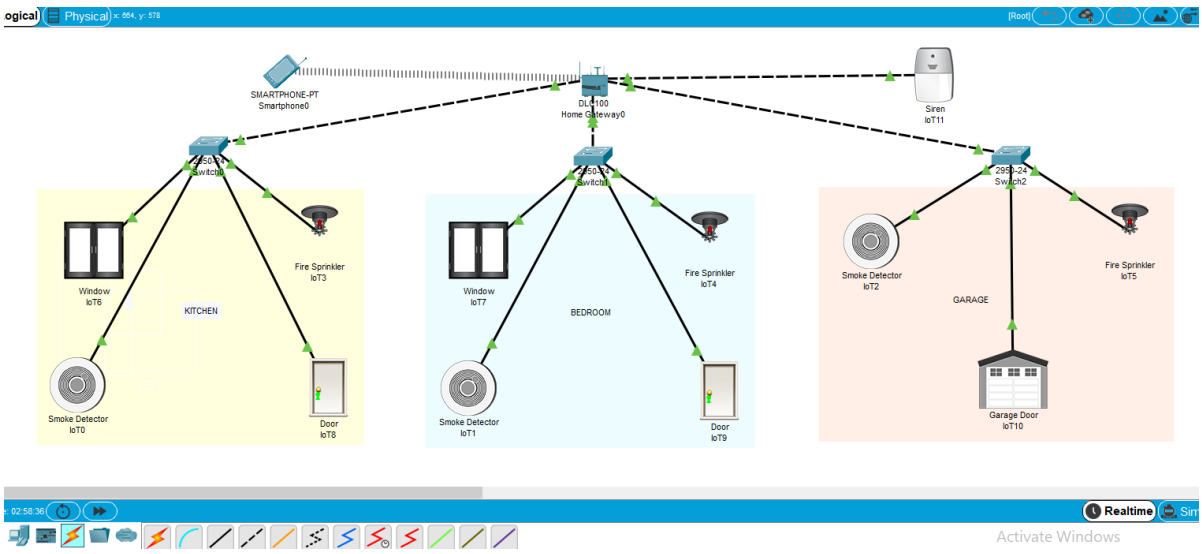
6) Siren

7) Home Gateway

8) Switch

9) Smart device

5. NETWORK DIAGRAM:



6. KEY CONCEPTS OF DCN

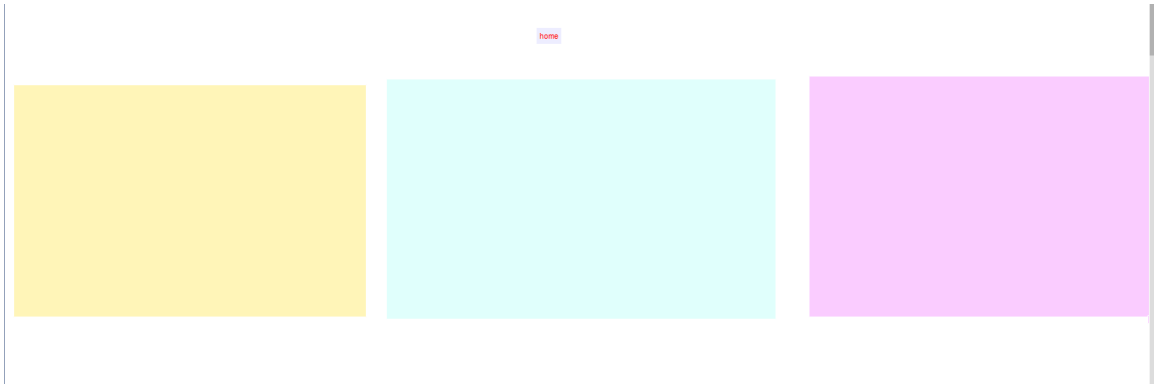
- ✓ We use the concept of VLan in over project to give us the notification on the without any delay or traffic.
- ✓ We use the concept of switching to connect over all devices together.
- ✓ Also we use the main concept of IOT(internet of thing) because it help us to control in or out side of the network remotely.
- ✓ We can also use telnet session for access remotely.
- ✓ For connectivity we use straight and cross cable.

7. IMPLEMENTATION & WORKING:

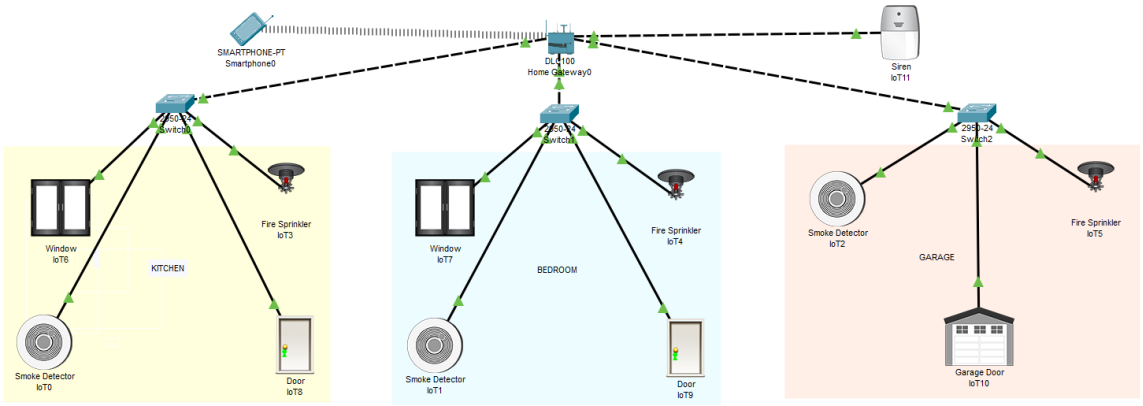
Set up the network topology with devices such as HomeGateway, switches, smoke detectors, fire sprinklers, smoke sensors, WiFi module, and siren.

- ✓ Connect the devices using network cables.
- ✓ Configure the HomeGateway to enable mobile applications.
- ✓ Configure the smoke detectors and sensors to detect smoke and temperature rise.
- ✓ Set up the siren to activate when smoke or a significant rise in temperature is detected.
- ✓ Simulate a fire or smoke scenario to test the smoke detection system.
- ✓ Use the mobile application connected to the HomeGateway to monitor the system and receive alerts.

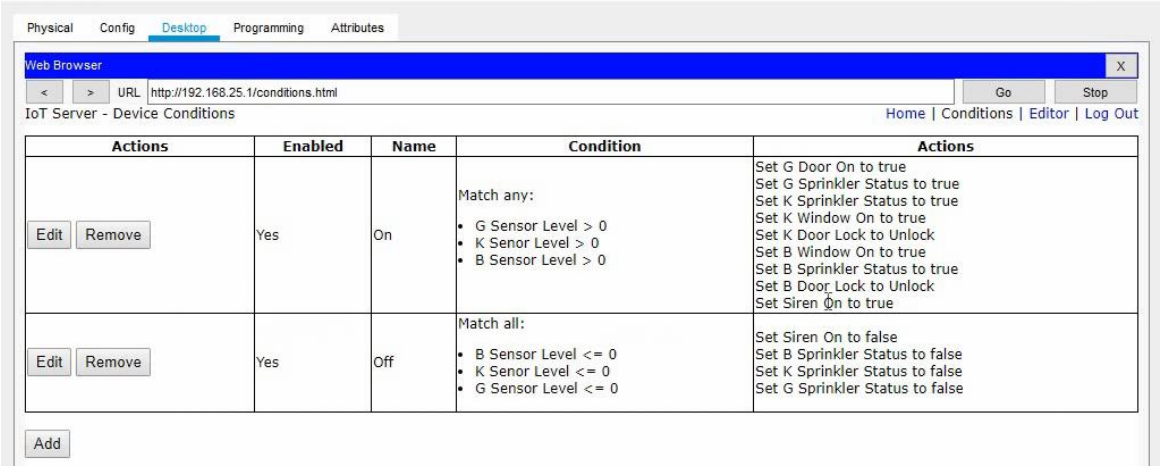
Create a House:



Place the devices in the house and Connect/configure all components with the home gateway



Write condition for automation of fire prevention:



8. RESULTS:

The smoke detection project in Cisco Packet Tracer aims to provide early detection of smoke and temperature rise. When smoke or a significant temperature increase is detected, the system activates a siren for audible alert and sends notifications to a mobile application. The project demonstrates the effectiveness of the smoke detection system in preventing fire accidents and facilitating timely actions for evacuation and countermeasures. It emphasizes the importance of early detection for safeguarding lives and property.

9. APPLICATION / FEATURES:

The smoke detection project in Cisco Packet Tracer offers applications such as fire prevention, early warning, remote monitoring, and property protection. Its features include real-time alerts, an integrated alarm system, and a mobile command center. Overall, the project enhances safety by detecting smoke and temperature changes, providing timely notifications, and enabling remote monitoring and control. These smoke & fire detection systems use automatic functions to detect the occurrence of an event that may result in a fire. They receive a sign from a fireplace sensing smoke and mechanically transmit it to the fireplace siren panel. The fire siren panel activates sprinklers and opens all windows and doors.

10. CONCLUSION:

Smoke detectors are great because they save lives. There are smoke detectors formed as noses, to smell for smoke. There should be a minimum of two or three smoke detectors in your home. You should install a smoke detector on each floor of a house. Always have a smoke detector and fire prevention system in your home for your safety.

11. REFERENCES:

https://youtu.be/PYqIvoPEmRA