SMART GARDEN - CISCO PACKET TRACER

Abstract

The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. Accordingly, the configuration of lawn Sprinkle and monitoring the water level by using a sensor with IoT registration server in order to Design a Smart Home Garden using cisco packet tracer.

Motivation / challenge

The main moto of this project is to conserve the water during the time of irrigation. Here managing of water alone is not focused but also to fix the rotting of plantlets due to excess supply of water.

The challenge faced by our team is the real time implementation and the durability of the microcontrollers used. This is because the exposure microcontrollers and the sensors like servers, routes, and monitor i.e. laptops, to fluids [water] which might cause mal-functioning or mis-interpretation during the working process.

To over come this microcontrollers and the necessary sensors is placed in such a manner that it will not be exposed to moisture [water]. So this will not lead to any mal-functioning of the entire system.

Objective

Construction of a smart garden using cisco packet tracer.

Software / Hardware requirements

Cisco packet tracer

Engineering Standards

A vegetable or herb garden that is controlled by computer. Although farming and gardening have been enhanced with computers and electronic devices for decades, the smart garden often refers to small, indoor units that by various means determine when to alert the user to add nutrients. Smart gardens may also manage their own lighting. Level sensors are used to detect the level of substances that can flow. Such substances include liquids, slurries, granular material and powders. Level measurements can be done inside containers or it

can be the level of a river or lake. Such measurements can be used to determine the amount of materials within a closed container or the flow of water in open channels.

Realistic constraints

Reliability:

The model is not completely reliable as at some point of time there are chances for the equipment's to malfunction due to several external and internal conditions.

Usability:

Nutrition & cooking

Grow 100% organic food to boost your health and vitality. Enjoy plants packed with the vitamins, nutrients and antioxidants your body craves.

Stress relief

Nature is a great healer. Growing plants indoors can help improve your well-being in multiple ways, leading to calmer, more productive days.

Decoration

A Smart Garden never looks out of place. Its simple yet beautiful design compliments any room. Flowers growing in a Smart Garden are a real eye-catcher.

Durability:

The equipment's used in the model are wear and tear tested and are placed in a way that they are not damaged by water or any other fluids around. Hence it has the ability to withstand for long period of time without any detoriation.

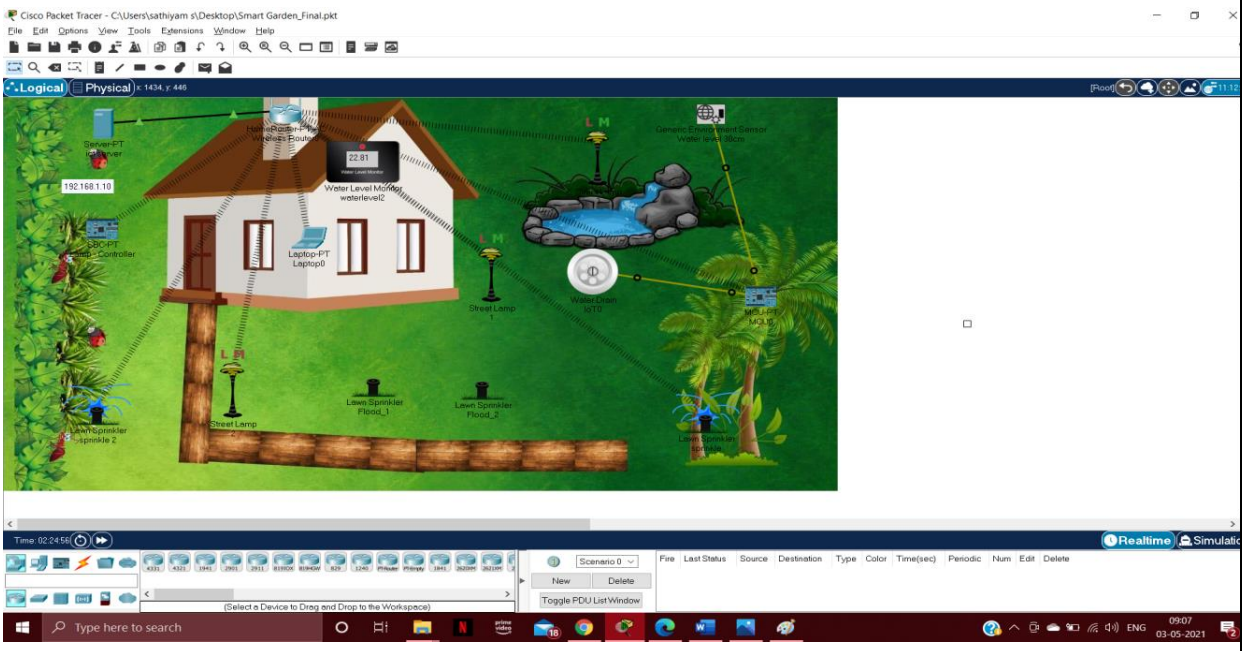
Failure transparency:

The main failure is the entire system except the sprinkler and the water monitoring sensor are very sensitive to water or any fluids.

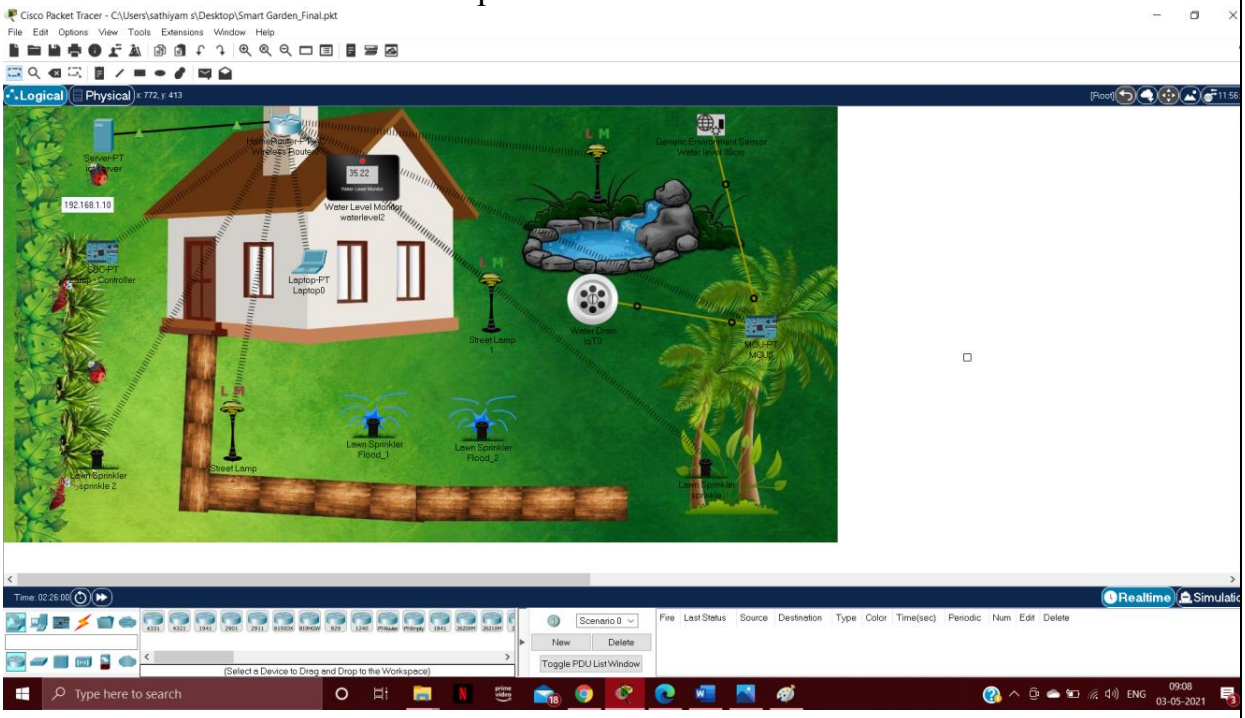
Deliverables

Methodology

Water level below 25.00



Water level above 30 cm drain open



Algorithm :

Step 1 : Place the water level indicator, Lawn sprinkler, Server and a wireless router in the framework.

Step 2: Connect the server with the wireless router and the IP address 192.168.1.10 is assigned to the server.

Step 3: Configure the GUI interface of the wireless router and name your network(SSID).

Step 4: Place the laptop in the framework and connect it with the wireless server.

Step 5: Connect the lawn sprinkler to the wireless router.

Step 6: Connect the water level monitor to the wireless router.

Step 7: Edit the iot server IP address in the desktop and also create username and password.

Step 8: Rename and register the lawn sprinkler and the water level monitor with the IOT server using the already created username and password.

Step 9: Open the web browser and login to check the status of registered lawn sprinkler and water level indicator.

Step 10: Set the condition for water level to turn on and off the sprinkler.

Step 11: A water drainer is set to drainn the excess water and during heavy rainfall.

Step 12 : A smart street lamp is set which switches on between 6pm – 7am automatically.

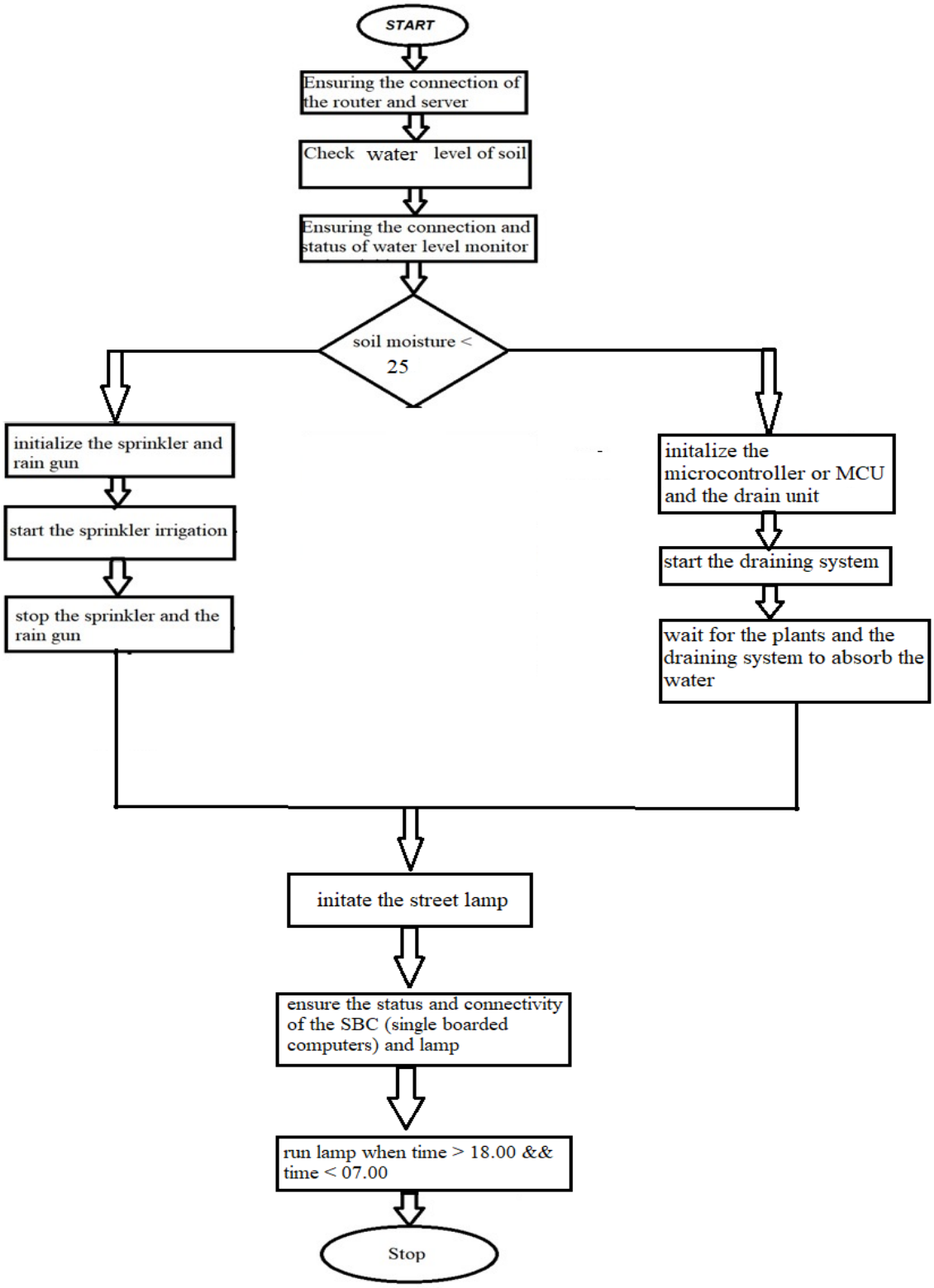
Step 13: We are all set and the SMART GARDEN – WATER LEVEL MONITORING is ready for use.

Individual contribution:

The topic of our project SMART GARDEN using cisco packet tracer was discussed and implemented by me and my fellow teammates. This project was never done individually. Each and every part i.e. from designing till the execution was discussed and developed by our team.

The only part done individually was the preparation of this report and the ppt. Each person in my team is assigned with some particular topic which was typed and joined to the temporary report and again with the help of the discussion we can out with is final report and the power point presentation

Flow chart:


START
Ensuring the connection of the router and server
Check water level of soil
Ensuring the connection and status of water level monitor
soil moisture < 25
initialize the sprinkler and rain gun
start the sprinkler irrigation
stop the sprinkler and the rain gun
initalize the microcontroller or MCU and the drain unit
start the draining system
wait for the plants and the draining system to absorb the water
initate the street lamp
ensure the status and connectivity of the SBC (single boarded computers) and lamp
run lamp when time > 18.00 && time < 07.00
Stop

The initial step of the model is to check the connection of the server and the router. The next step is to check the status and connection of the water level montor and the water level in the garden.If the water level is less than 25 then the next step is to initialize the sprinkler and the rain gun. After the water level reaches the limit then the sprinkles and rain gun is stopped. On the other hand if the water level is more than 25 during the initial water level checking then we wait the plants to absorb the water and then perform the above mentioned actions.In case of flood in the garden due to malfunctioning of sprinkler or any external issues the water drain opens if water level is greater than 30 cm and drains the excess water in the garden. The final step is to initiate the street light and it automatically switches on between 6pm to 7am.

Result

The smart garden using cisco packet tracer is constructed successfully.

Conclusion

Smart Garden is a plant environmental monitoring system, which monitors the soil moisture, air temperature, and air humidity of your plant(s) and automatically waters the plant based on the data received by sensors. Smart gardens and smart soil technology make it possible to grow almost any plant indoors, wherever you may be. In tropical climates, for example, it's difficult to grow favourites such as strawberries and green lettuce outdoors. In colder climates it can be difficult to grow chili peppers outdoors. With smart soil and your smart garden, you can have success growing all of these plants and many more from the comfort of your home.

Reference

Behrouz A.Fehrouzan, "Data communication & Networking", Mc-Graw Hil.

Andrew S.Tanenbaum, "Computer Networks", Pearson Education India,

https://itexamanswers.net/cisco-packet-tracer-tutorial-for-beginners-how-to-use-packet-tracer

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