SMART GARDEN IN CISCO PACKET TRACER

A PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

Certified that this B.Tech project report titled "**SMART GARDEN IN CISCO PACKET TRACER**" is the bonafide work of PRANEETH VANAPARTHI [RA2111003010678], AALAP SANGVIKER [RA2111003010690],GANESH.P [RA2111003010691],SUDESHA NANDHAGOPAL[RA2111003010668],NAVIN BALAJI [RA2111003010683] who carried out the project work under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion for this or any other candidate.

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CHAPTER - 1: ABSTRACT

- This abstract describes the use of Cisco Packet Tracer for simulating a smart garden. Smart gardens are an emerging technology that use sensors, controllers, and actuators to automate and optimize the process of growing plants.

- Cisco Packet Tracer, typically used for simulating computer networks and network devices, can be a useful tool for experimenting with and learning about the technology behind smart gardens.

- By creating a network topology that includes sensors, controllers, and actuators, and configuring them to communicate with each other and with a central controller or hub, users can experiment with different types of communication protocols and technologies commonly used in smart gardens.

- A smart garden refers to a system that uses technology to manage and monitor various aspects of gardening. This includes the use of sensors, internet of things (IoT) devices, and automation to optimize plant growth and health while reducing human effort.

- Some features of a smart garden may include automated watering and fertilizing, real-time monitoring of temperature, humidity, and lighting conditions, and recommendations for plant care based on environmental factors.

- At its most basic, a smart garden also conserves the time spent gardening by the user. It is one of themost effortless ways to water one's plants and grass.

CHAPTER – 2: INTRODUCTION

- Cisco Packet Tracer is a powerful tool for simulating computer networks and network devices. While it may not seem like an obvious choice for simulating a smart garden, it can actually be a useful tool for experimenting with and learning about the technology behind smart gardens.

- Smart Garden is a modern approach to gardening that uses advanced technology to improve the efficiency and sustainability of the traditional gardening process. It is an innovative system that employs sensors and automated controls to monitor and adjust the environmental conditions required for plant growth, including temperature, humidity, and soil moisture. This system ensures optimal plant growth conditions and enables gardeners to achieve higher yields with less effort and fewer resources

- To create a simulated smart garden in Cisco Packet Tracer, you would first need to create a network topology that includes the various devices that make up a smart garden, such as sensors, controllers, and actuators. You would then need to configure these devices to communicate with each other and with a central controller or hub.

- For example, you might create a network topology that includes a soil moisture sensor, a temperature and humidity sensor, a light sensor, a water pump, and a microcontroller or single-board computer such as an Arduino or Raspberry Pi. You would then configure the sensors to send data to the microcontroller, which would use this data to determine when to turn on the water pump to water the plants.

CHAPTER –3: MOTIVATION /CHALLENGE:

- The motivation for using Cisco Packet Tracer for simulating a smart garden is to provide an accessible and affordable platform for experimentation and learning about this emerging technology.

- Smart gardens have the potential to revolutionize the way we grow plants by automating and optimizing the process of plant care. However, building and testing a real-world smart garden can be expensive and time-consuming.

- By using Cisco Packet Tracer to create a simulated smart garden, users can experiment with different types of sensors, controllers, and communication protocols without the need for expensive equipment or physical space.

- The motivation is to provide a learning platform that can inspire and enable more people to contribute to the development of this exciting field and ultimately, help to create more sustainable and efficient ways of growing plants.

- Smart home garden helps one in keeping their field green and maintain water levels in the ground as desired by the user. The motivation of this mini project is to design and analyze the working of smart garden.

CHAPTER – 4: OBJECTIVE:

- The smart garden provides automatic water conditioning of one's garden. They are time saving systems. The objective of this project is to show how to configure lawn sprinkler and monitoring the water level by using a sensor with IoT registration server in order to design a Smart Home Garden.

- The objective of using Cisco Packet Tracer for simulating a smart garden is to provide a platform for experimentation and learning about the technology behind smart gardens.

- By creating a simulated environment that includes sensors, controllers, and actuators, and configuring them to communicate with each other and with a central controller or hub, users can gain hands-on experience with the technology and explore different types of communication protocols and technologies commonly used in smart gardens.

- The goal is to foster a deeper understanding of how smart gardens work and how they can be optimized to improve the growth and health of plants. Ultimately, the objective is to help users develop the skills and knowledge needed to design, build, and maintain their own smart gardens, and to contribute to the advancement of this emerging field.

CHAPTER -5: REQUIREMENTS

- **Software requirement:** Cisco Packet Tracer

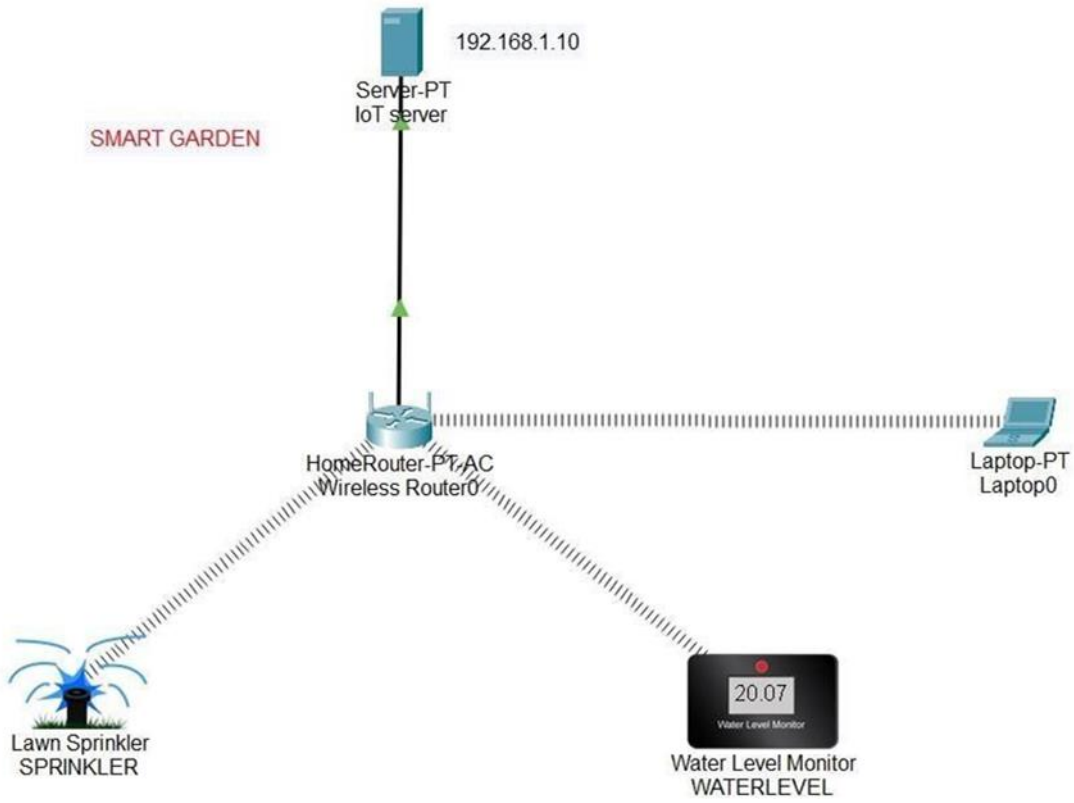
- **Sensor Modules:** These are the devices that measure and collect data on the environment and soil conditions, such as temperature, humidity, light, and soil moisture.
- **Control Unit:** The control unit processes the data collected by the sensor modules and uses it to determine the optimal watering.
- **Internet Connectivity:** Smart Garden systems require internet connectivity to access plant databases and provide real-time updates and recommendations to the gardener.
- **Mobile App:** A mobile app is used to manage and control the Smart Garden system remotely, allowing the gardener to receive alerts, track the plant's progress, and adjust settings as necessary.
- **Power Supply:** Smart Garden systems require a stable power supply to operate continuously. Solar panels and battery backups can be used to ensure uninterrupted power supply in areas with unstable electricity.
- **Pots or Planters:** The pots or planters used for the Smart Garden system should be suitable for indoor or outdoor use and have proper drainage to prevent waterlogging.
- **Installation and Setup:** Installation and setup may require some technical expertise, including assembling the system, configuring the sensors and control unit, and connecting the system to the internet and mobile app.

CHAPTER – 5: ARCHITECTURE & DESIGN

- **Realistic constraints:** This model may not always perform the tasks as it is supposed to if the user lost their credentials or Internet access.

- **Deliverables:** The smart garden is a system designed to prevent much time spent by the user gardening one's field by operating watering of the garden from a private computer network. The user has the access to set the gardening techniques and ways which the user would use as per the climatic conditions.

Figure 5.1



CHAPTER – 6: ALGORITHEM

- Creates a home server with desired IP address.
- Connect a wireless router to a home server using a cable.
- Give the GUI IP address in the router
- Define desired SSID name.
- Connect a laptop using SSID and wireless authentication (WPA2-PSK with Phrase as 12345678), similarly connect all the sprinklers and monitor.
- Register desired server login credentials in the IoT server.
- Update all the components with the IoT server credentials
- Get the remote access to the server using laptop (web browser/URL) with IP Address and credentials of the IoT server.
- Finally set the conditions required for monitoring the water level with respect to sprinklers and monitor.

CHAPTER – 7: CONDITIONS

TABLE 7.1

SPRINKLER-ON	WATERLEVEL Water Level <= 40.0 cm	Set SPRINKLER Status to true Set SPRINKLER2 Status to true Set SPRINKLER1 Status to true
SPRINKLER-OFF	WATERLEVEL Water Level > 60.0 cm	Set SPRINKLER Status to false Set SPRINKLER2 Status to false Set SPRINKLER1 Status to false

CHAPTER – 8: OUTPUT

FIGURE 8.1

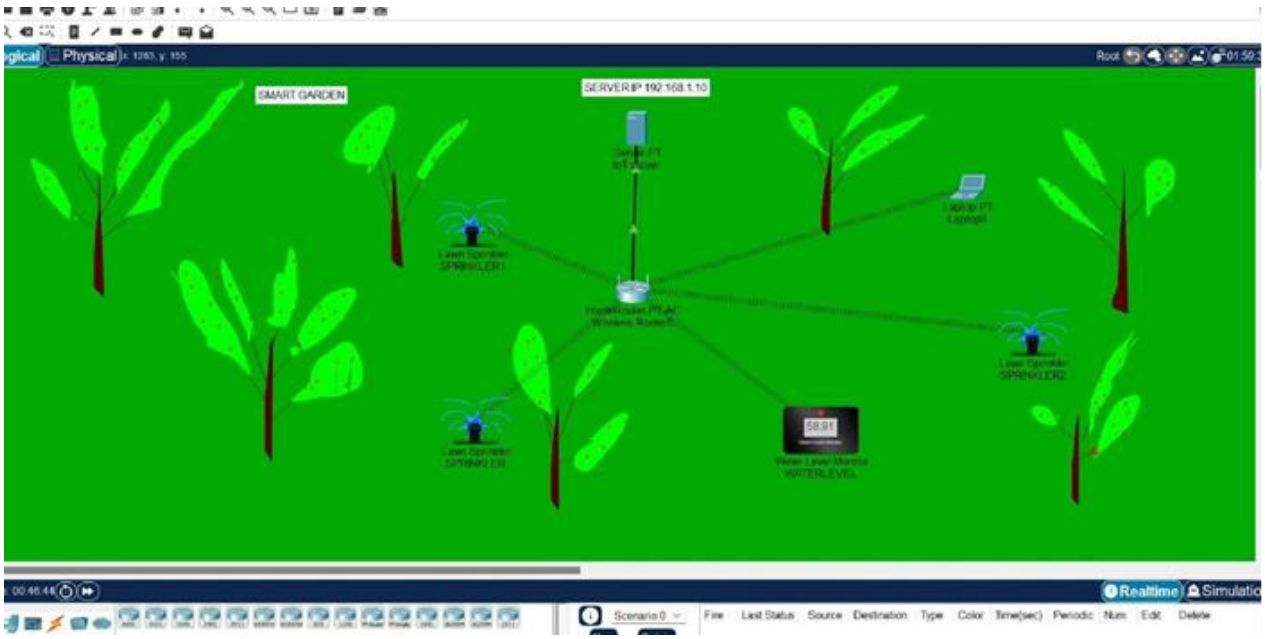


FIGURE 8.2

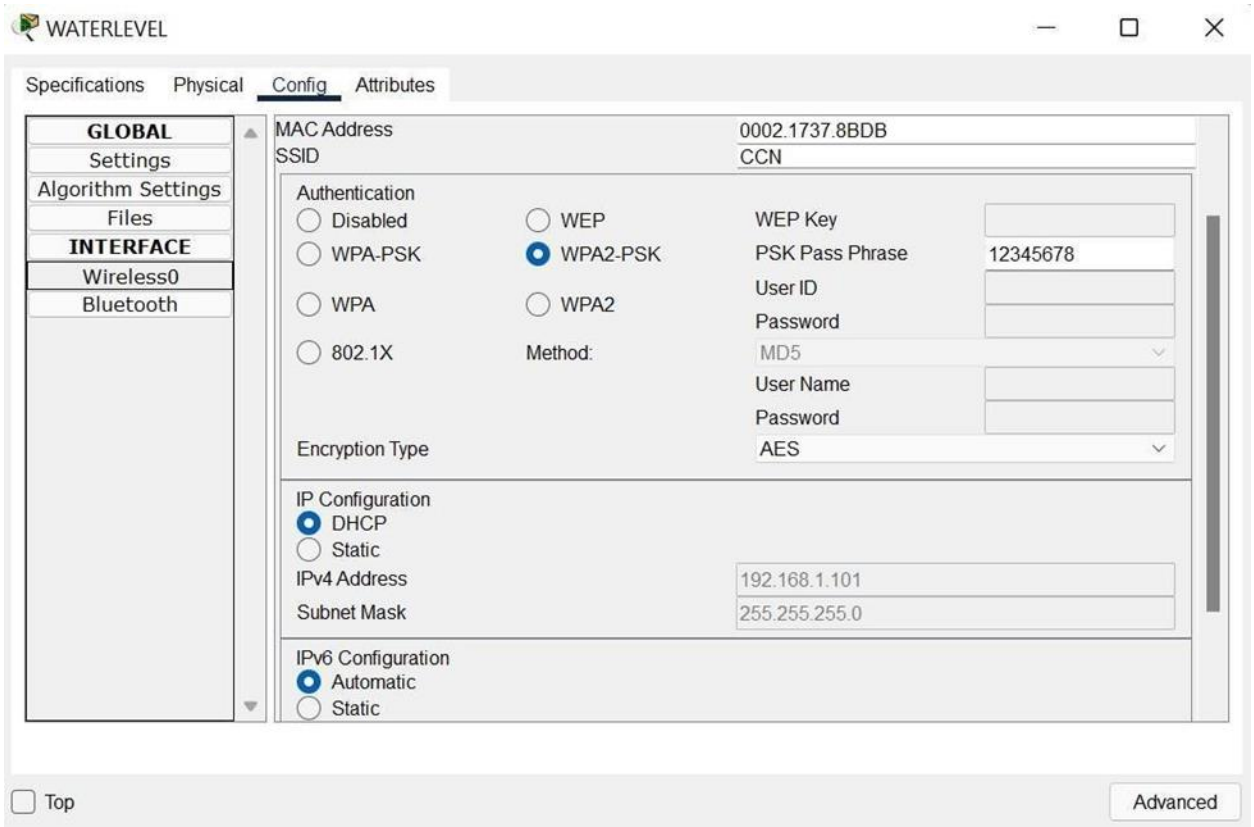


FIGURE 8.3

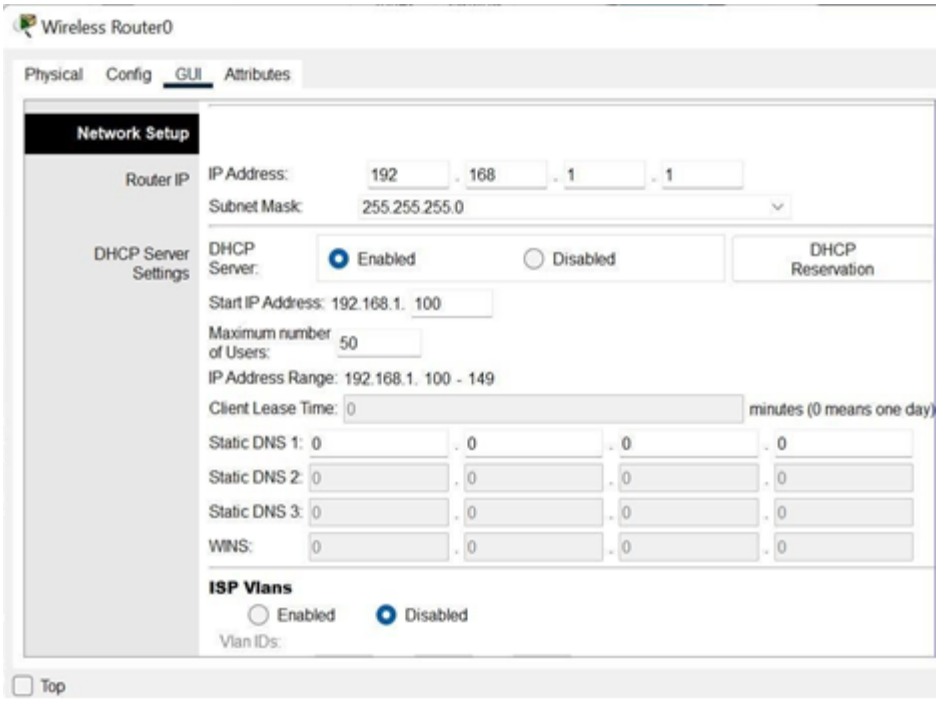


FIGURE 8.4

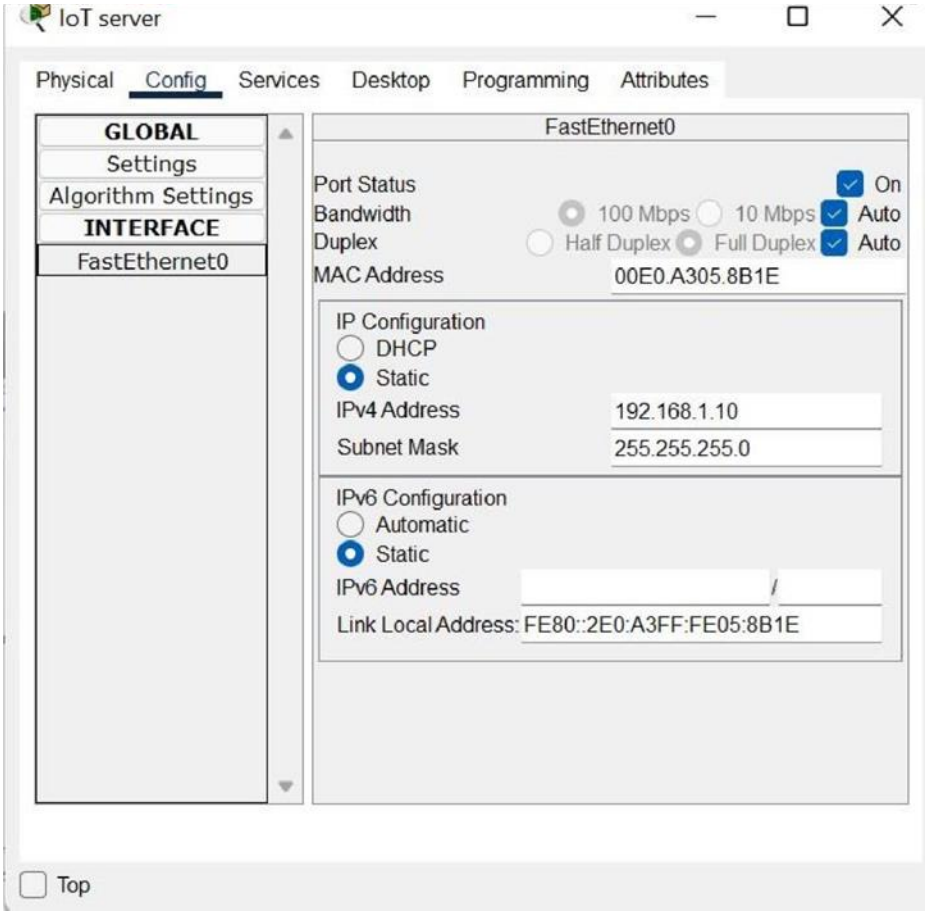
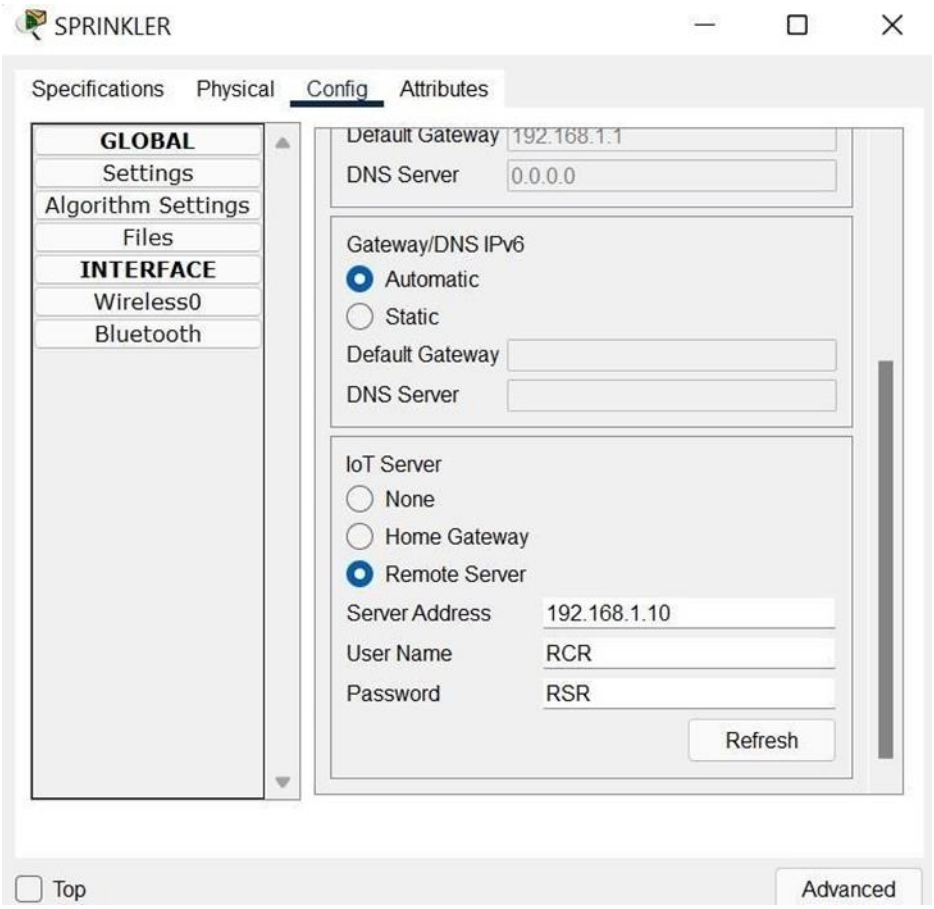


FIGURE 8.5


SPRINKLER
Specifications
Physical
Config
Attributes
GLOBAL
Settings
Algorithm Settings
Files
INTERFACE
Wireless0
Bluetooth
Default Gateway 192.168.1.1
DNS Server 0.0.0.0
Gateway/DNS IPv6
Automatic
Static
Default Gateway
DNS Server
IoT Server
None
Home Gateway
Remote Server
Server Address 192.168.1.10
User Name RCR
Password RSR
Refresh
Top
Advanced

CHAPTER – 9: CONCLUSION

The results of using Cisco Packet Tracer for simulating a smart garden can vary depending on the specific setup and configuration of the simulation. However, some potential results and benefits of using this simulation environment may include:

- Improved understanding of the technology behind smart gardens: By experimenting with different sensors, controllers, and communication protocols, users can gain a deeper understanding of how smart gardens work and how they can be optimized to improve plant growth and health.

- Development of skills and knowledge: By working with Cisco Packet Tracer to simulate a smart garden, users can develop skills and knowledge in areas such as network configuration, programming microcontrollers, and troubleshooting issues.

- Exploration of new ideas: The simulation environment allows users to explore and develop new ideas for smart garden design and optimization without the need for expensive equipment or physical space.

- Testing of communication protocols: Users can test different communication protocols commonly used in smart gardens, such as Wi-Fi, Bluetooth, and Zigbee, to determine which ones work best for their specific setup.

- Identification of potential issues: By simulating different scenarios, users can identify potential issues that may arise in a real-world smart garden, and take steps to address them before implementing the system.

- Overall, using Cisco Packet Tracer to simulate a smart garden can provide a valuable learning experience for those interested in the technology behind smart gardens, and can help users develop the skills and knowledge needed to design and build their own systems.

- The smart garden was created successfully and the output was verified.

CHAPTER – 10: REFERENCE

- https://www.youtube.com/watch?v=DdeXrsMFnq4
- https://github.com/CSCult/smart-garden