



NEW HORIZON COLLEGE OF ENGINEERING

New Horizon Knowledge Park, Ring Road, Marathalli

Autonomous College Permanently Affiliated to VTU, Approved by AICTE & UGC

Accredited by NAAC with 'A' Grade, Accredited by NBA

“Smart Agriculture Using Cisco Packet Tracer”

A MINI PROJECT

REPORT

Submitted by

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In partial fulfillment for the award of the degree of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE

Certified that the mini project work entitled “**Smart Agriculture Using Cisco Packet Tracer**” carried out by, **A Hemanth Reddy(1NH18EC701), B Rathan Teja(1NH18EC707), Santhosh H M(1NH18EC745), Rajashekar Reddy T V (1NH19EC411)** bonafide students of Electronics and Communication Department, New Horizon College of Engineering, Bangalore.

The mini project report has been approved as it satisfies the academic requirements in respect of mini project work prescribed for the said degree.

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1.

2.

Signature with Date

ABSTRACT

Smart agriculture is an arising idea, on the grounds that IOT sensors are equipped for giving data about agriculture fields and afterward follow up on dependent on the client input. In this Paper, it is proposed to build up a Smart agriculture System that utilizations favorable circumstances of bleeding edge innovations, for example, Arduino, IOT and Wireless Sensor Network. The paper targets utilizing advancing innovation for example IOT and smart agriculture utilizing mechanization. Checking natural conditions is the central point to improve yield of the effective harvests. The element of this paper incorporates advancement of a framework which can screen temperature, dampness, dampness and even the development of animals which may decimate the harvests in agrarian field through sensors utilizing Arduino board and if there should be an occurrence of any inconsistency send a SMS warning just as a notice on the application produced for the equivalent to the rancher's smartphone utilizing Wi-Fi/3G/4G. The framework has a duplex correspondence connect dependent on a cell Internet interface that takes into consideration information assessment and water system planning to be customized through an android application. Due to its energy self-rule and ease, the framework can possibly be valuable in water restricted geologically disconnected territories.

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CHAPTER 01

INTRODUCTION

Smart Agriculture is an arising idea that allow to overseeing utilizing current Information and Communication Technologies to expand the amount and nature of items while advancing the human work required. IoT has changed the present world. Savvy urban areas, keen vehicle, shrewd homes everything around us can be transformed into a brilliant gadget with the assistance of IoT. The constant natural boundaries like soil dampness level, temperature and tank water level have nonstop impact on the harvest lifecycle. Keen Farming and IoT-driven agribusiness are preparing for what can be known as a Third Green Revolution.

To improve the farming yield with less assets and work endeavors, significant developments have been made all through mankind's set of experiences. In any case, the high populace rate never let the interest and supply coordinate during every one of these occasions. As per the determined figures, in 2050, the total populace is relied upon to contact 9.8 billion, an expansion of around 25% from the beneath outline. Nearly the whole referenced ascent of populace is anticipated to happen among the non-industrial nations. On the opposite side, the pattern of urbanization is anticipated to proceed at a quickened pace, with about 70% of the total populace anticipated to be metropolitan until 2050 (presently 49%). Besides, pay levels will be products of what they are presently, which will drive the food request further, particularly in non-industrial nations. Accordingly, these countries will be more cautious about their eating routine and food quality; subsequently, purchaser inclinations can move from wheat and grains to vegetables and, later, to meat. To take care of this bigger, more metropolitan, and more extravagant populace, food creation should twofold by 2050. Especially, the current figure of 2.1 billion tons of yearly oat creation should contact roughly 3 billion tons. For food, however crop creation is getting similarly basic for industry; in fact, crops like cotton, elastic, and gum are assuming significant parts in the economies of numerous countries. Besides, the food-crops-based bioenergy market began to increment as of late. Indeed, even before 10 years, just the creation of ethanol used 110 million tons of significant obstacles of innovation usage in shrewd horticulture.

Specialists and designers around the world are proposing various strategies and structures and dependent on that recommending an assortment of gear to screen and bring the data with respect to edit status during various stages, considering various yield and field types. Zeroing in available interest, many driving makes are giving a scope of sensors, automated airborne vehicles (UAVs), robots, specialized gadgets, and other large equipment to convey the detected information. Likewise, different commissions, food and agribusiness associations, and government bodies are creating policies and rules to notice and control the utilization of these innovations to keep up food and climate security. There are sensible endeavors that feature the part of the IoT in the agribusiness business, yet a large portion of the distributed work zeros in just on applications. A large portion of the current articles either give no knowledge or show restricted spotlight on the different IoT-based models, models, progressed strategies, the utilization of IoT for food quality, and other future issues thinking about the most recent statistical data points. This original copy analyzes the patterns in IoT-based agribusiness research and uncovers various central points of contention that should be tended to change the horticulture business by using the new IoT improvements.

CHAPTER 02

Literature Review

Paper-1

Title: Smart Green House Monitoring based On IoT

Author: D.K. Sravani

Year of Publication: 2020

Outcome: In this paper the system monitors the temperature, soil moisture, humidity in favor of plant growth.

Limitations: This paper does not contain a large network and also, we cannot control the sprinkler from remote place.

Paper -2

Title: Cisco Packet Tracer To Simulate IoT Application

Author: Chandini K

Year of Publication: 2016

OUTCOME: Excellent watering system with keen control and smart leadership depend on exact constant field information. The sprinkler will be on when there is a change in temperature and humidity.

Limitation: This method is used usually and it was just like an ordinary method.

Paper -3

Title: Low-Cost Smart Irrigation Control System

Author: Beza Negash Getu

Year of Publication: 2015

Outcome: The fertility meter and ph. meter to determine the percentage of potassium, phosphorus, nitrogen which are the most important ingredients of soil. Wirelessly remote water control system helps proper yield.

Limitations: Farmers unable to know the status at the field. So, the farmers should be monitoring the field.

Paper-4

Title: Automatic Plant watering system

Author: Cosmin

Year of Publication: 2011

Outcome: Water is one of nature's most important gifts to mankind, because of the increase in population food requirement for human being is also increasing. This ultimate aim can be achieved by using the exiting and control system.

Limitations: Water is polluted due to wastage and contaminants in the industries.

CHAPTER 03

EXISTING SYSTEM AND PROBLEM STATEMENT

1. Smart Agriculture Using IOT

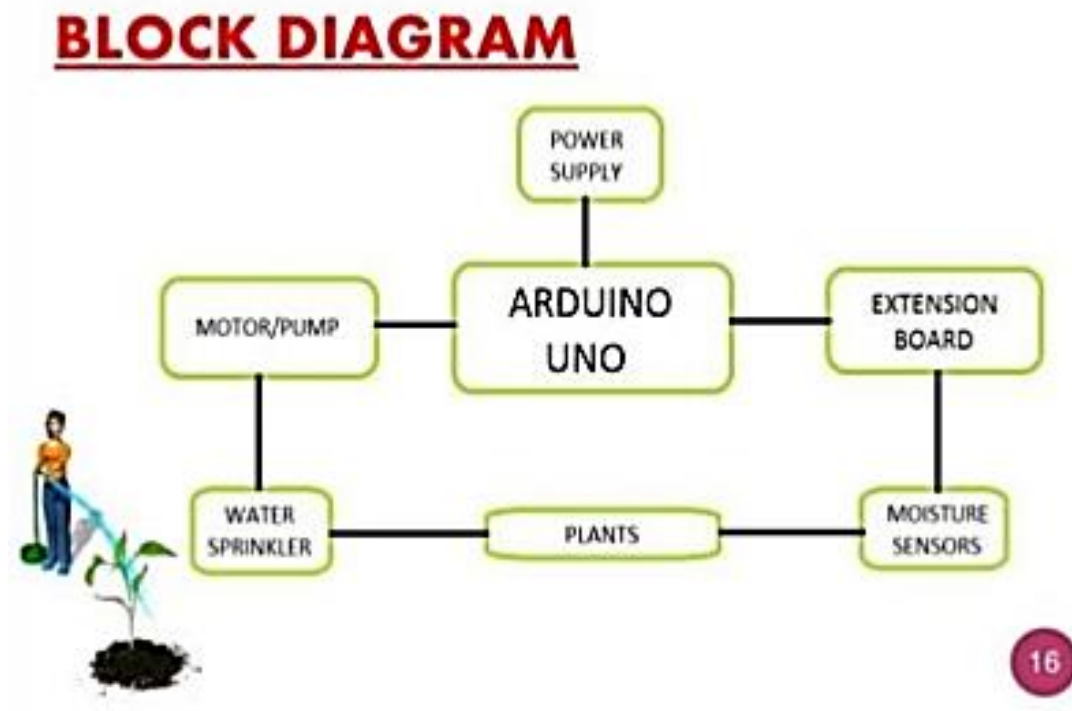


Figure 3.1 Block Diagram of Existing System

Objectives

- To save water and decrease human mediation in the agribusiness field.
- Continuously observing the status of soil through sensors and give sign to making a fundamental move.
- To get the yield of the sensor and give water to edit.
- To notice boundaries for better yield.
- System utilizes sensors to gauge the dampness boundary of the dirt.
- Outputs of the sensors estimated are simple in nature so the framework utilizes ADC which is inbuilt in microcontroller.

➤ The estimated an incentive from the sensor is contrasted and the limit esteem we have given.

Advantages

- Increase in productivity
- Reduced water consumption

Disadvantages

- > Extension board and resistors required.
- > Cost is very high
- > Requires more physical work

Conclusion

- The savvy water system framework is plausible and practical.
- The water system framework permits development in spots with water security consequently improving manageability.
- It demonstrates that the utilization of water can be decreased.

2. Smart Agriculture Using Pic Microcontroller and GSM Based Technology

System Overview

In smart agriculture utilizing pic microcontroller-based GSM innovation comprise of temperature sensor, dampness sensor, soil dampness sensor, light sensor, GSM module. All sensors are effectively interfaced with pic microcontroller.



Figure 3.2 Picture Of Existing System

Every sensor is independently associated with the pic microcontroller. The pic microcontroller utilized interfaced with GSM. This pi microcontroller sends all the information gathered by the every sensor to the GSM and this information showed on the LCD. The GSM module communicates something specific on cell phone. So on cell phone we get a specific name of sickness and medication for that infection which we will distinguish the or recognizing from our sensor information.

Conclusion

The framework incorporates both the equipment and programming interfaces and gives an effectively open and easy to use cell phone. In cell phone, message gives proposals and notices to practically all the issues looked by the ranchers. Henceforth the rancher can perform moment activities to any issue. The outcomes acquired from the estimation have demonstrated that the framework execution is very dependable and precise. The usage is created simpler subsequently this framework in the field can help of improve the yield of the harvests and in general creations. Every boundary is seen by independent sensor. Wi-Fi is progressed strategy so which is helpful for future work.

PROBLEM STATEMENT

A significant disadvantage is that models proposed in above examination papers are cost ineffectual. In addition, the models in the above exploration papers are very intricate. In some examination papers just information assortment is done and no move is made. In one of the exploration papers nitrogen, phosphorous and potassium are estimated yet the standard testing time for NPK is progressively a result of complex soil pre-treatment and compound assessment. Another disadvantage is high innovation. The model proposed by us is route less complex just as moderate. It utilizes modest yet viable innovation and incorporates all the benefits of the models proposed previously.

CHAPTER 04

PROPOSED SYSTEM

Block Diagram

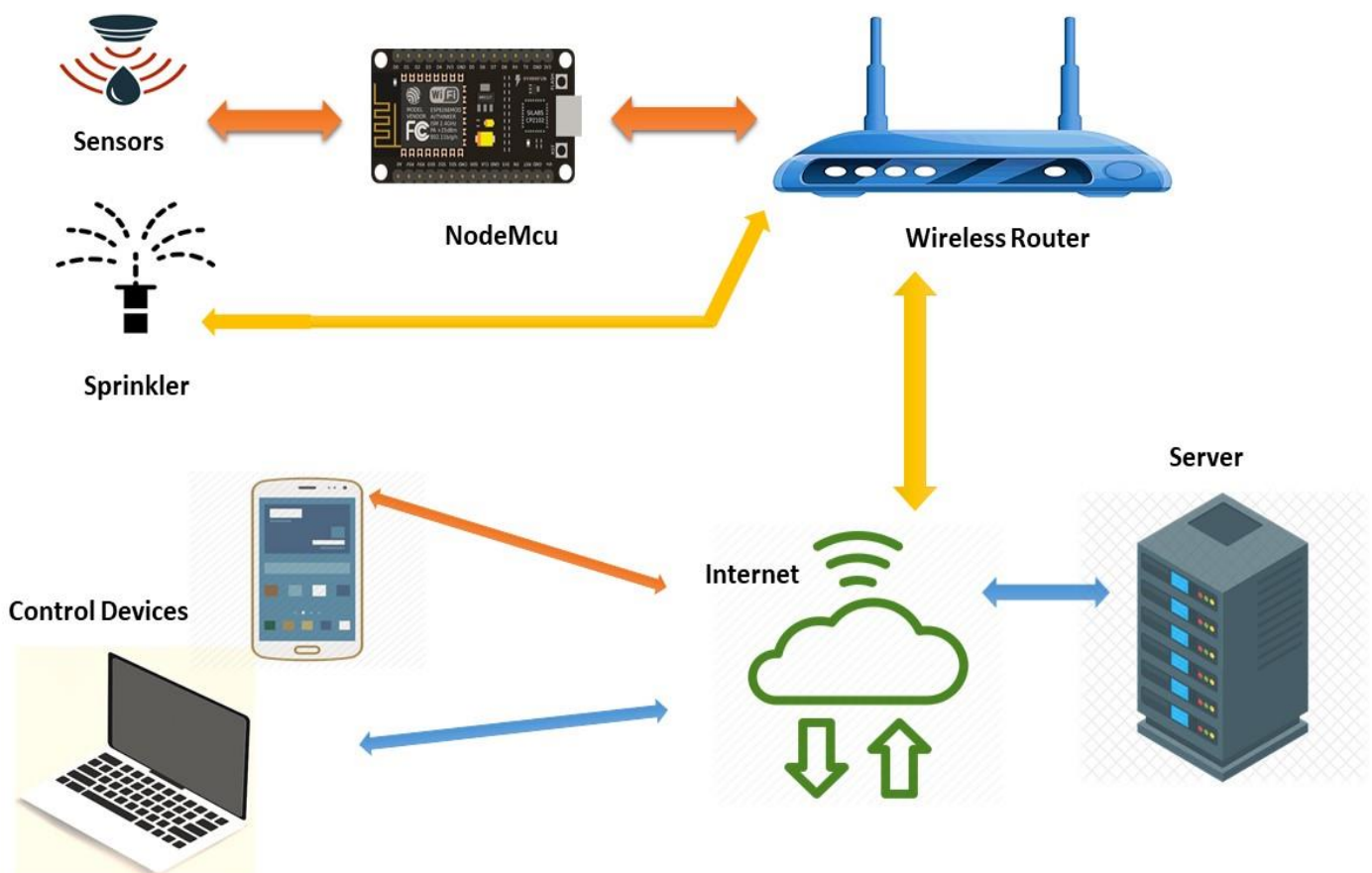


Figure 4.1 Block Diagram

The essential structure squares of an IoT System are Sensors, Processors and applications. So the square chart above is the proposed model of our undertaking which shows the interconnection of these squares. The sensors are interfaced with Microcontroller, information from the sensor is shown on the end gadgets when signed in.

Flow Chart

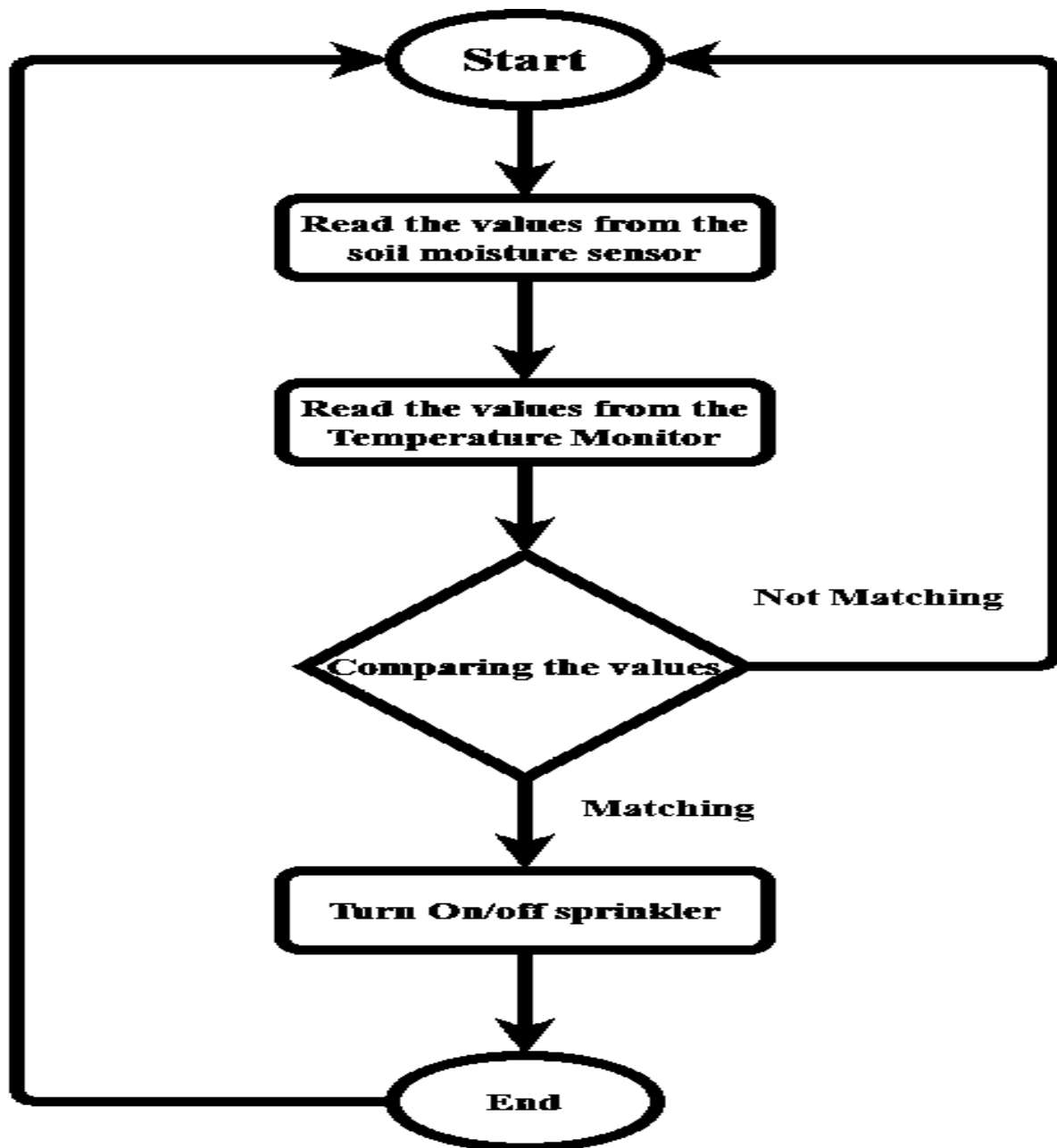


Figure 4.2 Flow Chart

At the point when the information of various sensors that are mugginess, temperature, soil dampness is procured it is shipped off the IoT of the client and if the water content in the dirt is not exactly the cut off worth and sprinkler gets turned on consequently.

Circuit Diagram

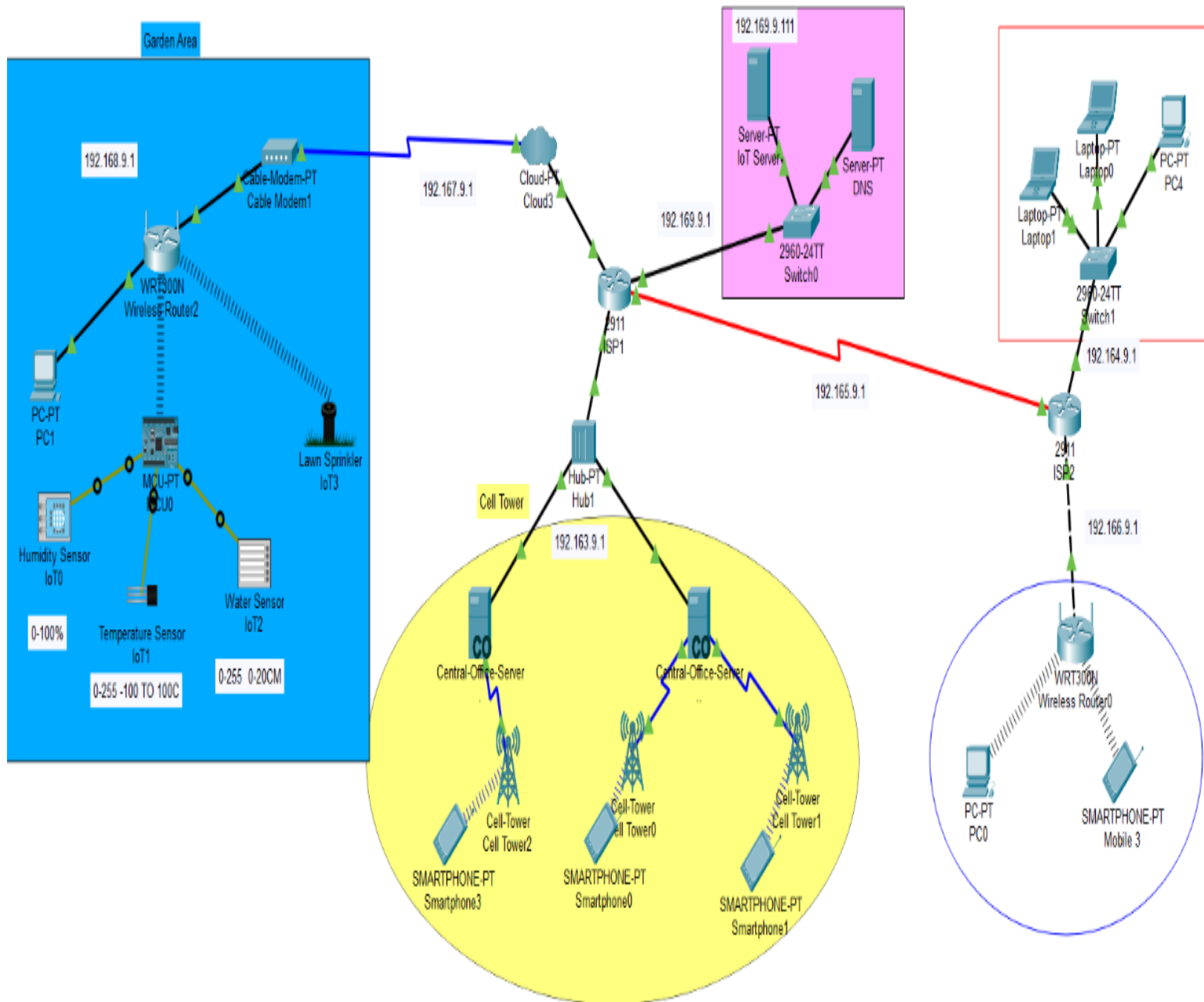


Figure 4.3 Circuit Diagram

In cisco packet tracer we have to select Nodemcu and sensors. The three types of sensors are humidity sensor, temperature sensor, water sensors. These sensors are connected to Nodemcu and then Nodemcu is connected to wireless router. Here router helps the network to forward messages. The sprinkler is directly connected to the wireless router. By using cisco packet tracer, we will connect a network which includes switches, servers, smartphone, cell-towers. We can operate by using any one of the end devices. Here the end devices are pc, laptop, mobile, server. For Nodemcu we will be giving a program in java. In Nodemcu while giving a programming we will give some conditions to it for on or off the sprinkler. If the temperature is $\geq 30^{\circ}\text{C}$ and the water level is $\leq 30\%$, then the sprinkler is turned on automatically. So that the farmers need not to check whether the sprinkler is on or off.

After that we will connect to a network of service provider. And the wireless router is connected to modem-PT switch and then to cloud. The cloud is used to link WAN networks.

The network is connected to ISP router. ISP router (Internet Service Provider) which provides the internet to the network. And the dedicated IoT Server and the DNS Servers are connected to ISP router. DNS servers helps to convert the logical address to IP address. By using this we will create a link to operate a network. The ISP router is also configured as DHCP server. In DHCP dynamically the configuration is done no need to enter manually. The cell towers are connected to Central office server where the signal will be getting to mobiles. And we can operate these networks through even mobiles. The link which we have created have username and password. By using this web address the entire network will be operated. After entering the username and password we can see real time data and also control the connected devices like sprinkler. We can switch on and off the sprinkler.

In short hand the project is explained as first the Nodemcu will reads the values of soil moisture sensor, and from the temperature sensor. After reading the values the Nodemcu will start comparing the values and the conditions which we gave already to it. The Nodemcu will act as input and the sprinkler will act as output. If the input values are satisfied then the network is further proceeded and it will make the sprinkler to on. If the values are not satisfied then the sprinkler will be off.

Network Devices Used

1. Router 2911

- 2911 Integrated Services Router (ISR) provides 2 integrated 10/100/1000 Ethernet ports, 4 enhanced high-speed WAN interface card (WIC) slots, 2 onboard digital signal processor (DSP) slots and 1 onboard Internal Service Module for application services.

2. Wireless Router WRT300N

- The WRT300N wireless router has a built-in antenna and provides four fixed 10/100 (100BASE-TX) Ethernet ports and one fixed Internet port (also 100BASE-TX, typically for connection to cable and DSL modems). It does not support modules.

3. Switch 2960

- The Cisco Catalyst 2960-24TT is a member of the Catalyst 2960 Series Intelligent Ethernet Switch family. It is a fixed-configuration, standalone switch that provides Fast Ethernet and Gigabit Ethernet connectivity networks. It does not support add-in modules.

4. Cloud

- Packet Tracer gives you access to a representation of a cloud. It provides ten slots, a console port, and an auxiliary port.

5. Cable Modem

- The Cable-Modem-PT provides one slot. The Cable-Modem-PT supports the same modules that the DSL-Modem-PT supports.

6. Central Office Server

- The Central Office Server has six built-in coaxial ports and one FastEthernet port.

7. Cell Tower

- The Cell Tower has one slot. It supports coaxial and 3G/4G module.

End Devices Used

1. PC

The PC-PT provides a console port and one slot.

2. Laptop

The Laptop-PT provides a console port and one slot.

3. Server

The Server-PT provides two slots. The Server-PT supports the same modules as the PC-PT except for the PC-HOST-NM-1AM, PC-HEADPHONE, and PC-MICROPHONE modules.

4. Smart Phone

The SMARTPHONE-PT does not support modules. However, it has built-in Wireless interfaces.

5. MCU

The MCU provides one slot and it has analog and digital ports for connecting sensors and actuators.

6. Lawn Sprinkler

It has one slot where the wireless interface is attached. End Devices Used

Sensors used

1. Temperature Sensor

Temperature Sensor is a sensor that outputs temperature in Celsius and operates at -100 degree Celsius to 100 degree Celsius.

2. Humidity Sensor

Humidity Sensor Detects humidity level in the air. It is represented in Percentage from 0- 100%.

3. Water Sensor

A sensor that detects amount of water in inch/cm.

CHAPTER 05

SOFTWARE SPECIFICATIONS

CISCO PACKET TRACER V 7.3.1

Packet Tracer is a cross-stage visual reproduction instrument planned by cisco frameworks that permits clients to make network geographies and impersonate current PC organization. The product permits clients to recreate the arrangement of Cisco switches a lot utilizing a reenacted order line interface. Packet Tracer utilizes an intuitive UI, permitting clients to add and eliminate reenacted network gadgets as they see fit. The product is principally engaged towards Certified Cisco Network Associate Academy understudies as an instructive device for assisting them with learning key CCNA ideas. As systems administration frameworks keep on advancing in multifaceted nature, new educational plans and instructive devices are arising to encourage educating and finding out about systems administration innovation. The Cisco Networking Academy program is intended to stay up with the development of systems administration frameworks by giving inventive educational plans and instructive devices that assist understudies with understanding the complexities of data and correspondence innovations (ICTs). Inside this structure, the Cisco Packet Tracer e-learning programming was created to help Networking Academy understudies acquire viable systems administration innovation abilities in a quickly evolving climate. Understudies looking for ICT abilities would now be able to profit by the openness of online educational programs and new open doors for social learning, coordinated effort, and rivalry. Complete systems administration innovation educating and learning programming created by Cisco Networking Academy Offers an extraordinary blend of sensible reproduction and perception encounters, complex appraisal and action writing capacities, and open doors for multiuser cooperation and rivalry. Packet Tracer's intuitive interface permits understudies to arrange and approve framework design.

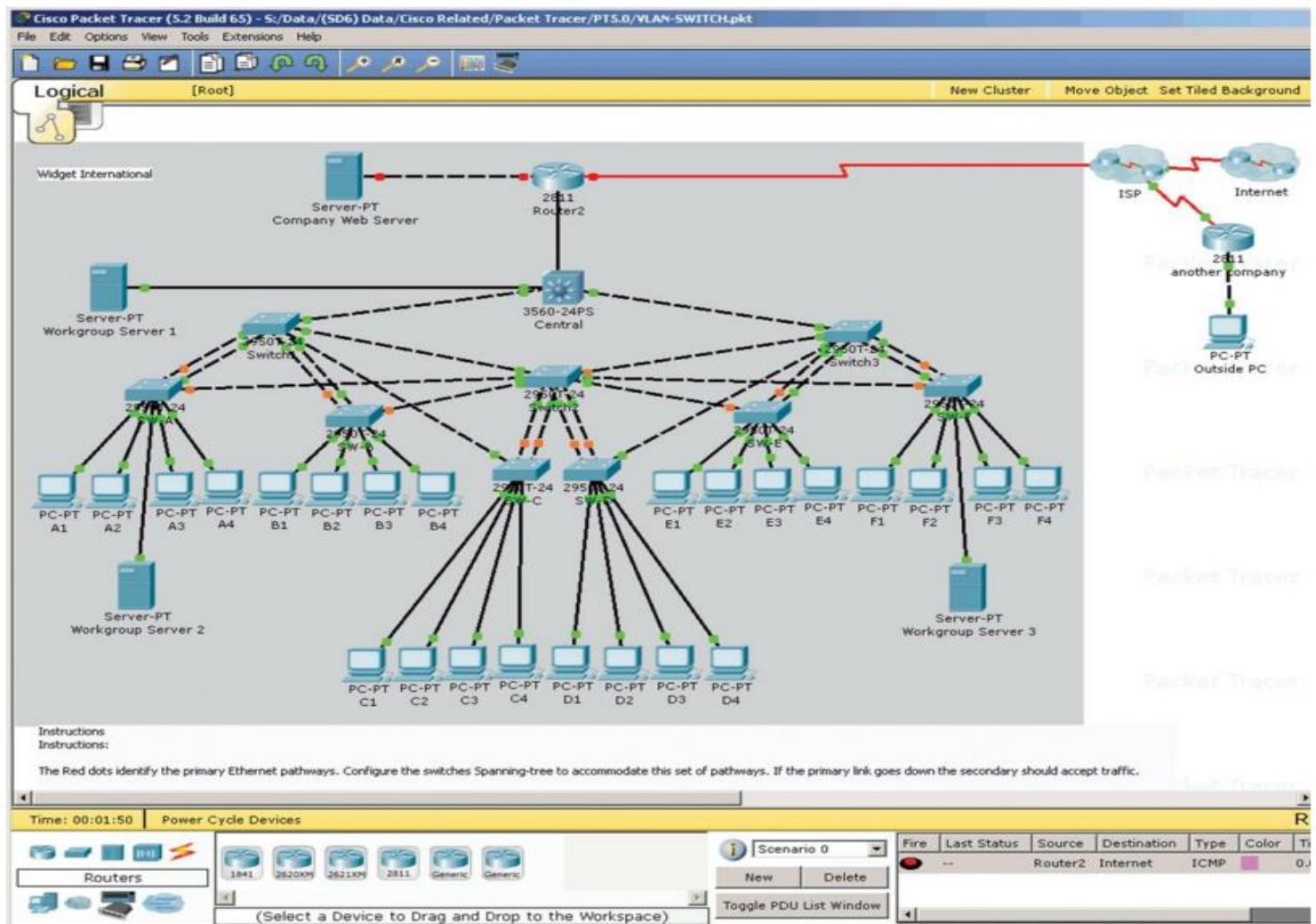


Figure 5.1 Cisco Packet Tracer Network Example

Packet Tracer Simulation-Based Learning

Innovative highlights help understudies and instructors team up, take care of issues, and learn ideas in a drawing in and dynamic social climate.

- Supports talks, gathering and individual labs, schoolwork, tests, games, coordinated efforts and rivalries.
- Allows educators to handily instruct and exhibit complex specialized ideas and systems administration frameworks plan.
- Helps understudies create significant 21st century aptitudes.

Advantages of Simulation-Based Learning

- Students who investigate and explore utilizing Packet Tracer create scholarly interest and basic reasoning abilities.
- Packet Tracer's outwardly rich reenactment climate encourages understanding of complex innovation ideas.
- Students who investigate networks utilizing Packet Tracer create critical thinking abilities.
- Students who plan and construct virtual organizations utilizing Packet Tracer improve their advancement and inventiveness aptitudes.
- Students who investigate ideas at their own speed in Packet Tracer's protected, virtual climate acquire trust in their dynamic aptitudes and capacities.
- Using Packet Tracer for group coordinated effort and rivalry exercises fabricates social, correspondence, and exchange aptitudes.

Educating Experience

Cisco Packet Tracer gives different occasions to educators to show organizing ideas. Despite the fact that Packet Tracer is certainly not a substitute for genuine hardware, it permits understudies to work on utilizing an order line interface. This "e-doing" ability is a major part of figuring out how to design switches constantly. Packet Tracer's recreation mode empowers teachers to exhibit measures that were in the past covered up to understudies. These reenactment capacities can help improve the learning cycle by giving tables, graphs, and other visual portrayals of inner capacities, for example, dynamic information moves and packet content development. The recreation mode likewise diminishes educator introduction time by supplanting whiteboards and static slides with continuous visuals.

Packet Tracer helps instructors teach complex networking concepts in the following ways:

- Provides a visual showing of complex advancements and setups.
- Allows educators to create tweaked, guided exercises that give prompt criticism utilizing the Activity Wizard.
- Facilitates various learning exercises, for example, talks, individual and gathering lab exercises, schoolwork, evaluations, games, network configuration, investigating, displaying errands, contextual analyses, and rivalries.
- Enables perception, liveliness, and itemized demonstrating for investigation, experimentation, and clarification.
- Supports independent learning outside the study hall.
- Supports social learning measures by empowering joint effort and rivalry.
- Supports most of conventions and advancements instructed in the accompanying Networking Academy educational programs: Cisco CCNA Discovery, CCNA Exploration, and CCNA Security, and can be utilized to encourage ideas from IT Essentials and Cisco courses

STUDENT EXPERIENCE

Understudies who invest more energy in an involved method of learning, with recreation and intuitive abilities, will be better prepared to apply ideas and setup essentials when presented to genuine hardware. As understudies acquire viable involvement in errands, for example, setup and investigating, they become more certain about their capacities. Cisco Packet Tracer's multiuser usefulness additionally gives an occasion to social getting the hang of, permitting understudies to work together and contend with one another and mess around that improve the learning experience. Multiuser games give fun learning occasions to cooperation and rivalry.

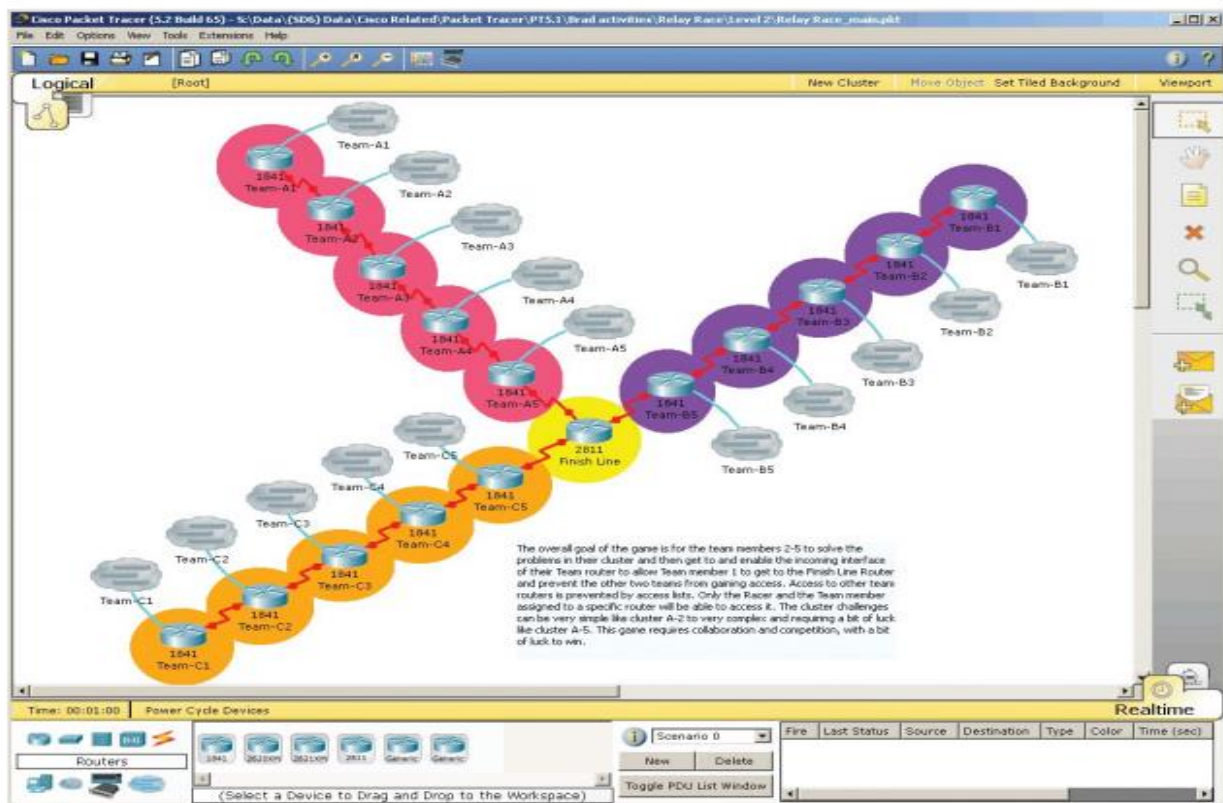


Figure 5.2 Packet Tracer Work Space

Key Features

Packet Tracer Workspaces:

Cisco Packet Tracer has two workspaces sensible and physical. The consistent workspace permits clients to assemble legitimate organization geographies by putting, associating, and grouping virtual organization gadgets. The actual workspace gives a graphical actual component of the consistent organization, giving a feeling of scale and situation in how network gadgets, for example, switches, switches, and has would glance in a genuine climate. The actual view additionally gives geographic portrayals of organizations, including numerous urban communities, structures, and wiring storerooms.

Packet Tracer Modes:

Cisco Packet Tracer gives two working modes to imagine the conduct of an organization—constant mode and reenactment mode. Progressively mode the organization acts as genuine gadgets do, with quick constant reaction for all organization exercises. The continuous mode gives understudies a suitable option in contrast to genuine gear and permits them to acquire arrangement practice prior to working with genuine hardware. In recreation mode the client can see and control time spans, the internal operations of information move, and the engendering of information across an organization. This assists understudies with understanding the essential concepts behind organization tasks. A strong comprehension of organization essentials can help quicken finding out about related concepts.

Cisco Packet Tracer supports the following protocols

| Layer | Cisco Packet Tracer Supported Protocols |
|--------------------------------------|--|
| Application | <ul style="list-style-type: none"> FTP, SMTP, POP3, HTTP, TFTP, Telnet, SSH, DNS, DHCP, NTP, SNMP, AAA, ISR VOIP, SCCP config and calls ISR command support, Call Manager Express |
| Transport | <ul style="list-style-type: none"> TCP and UDP, TCP Nagle Algorithm & IP Fragmentation, RTP |
| Network Access/ Interface | <ul style="list-style-type: none"> Ethernet (802.3), 802.11, HDLC, Frame Relay, PPP, PPPoE, STP, RSTP, VTP, DTP, CDP, 802.1q, PAgP, L2 QoS, SLARP, Simple WEP, WPA, EAP |
| Network | <ul style="list-style-type: none"> BGP, IPv4, ICMP, ARP, IPv6, ICMPv6, IP Sec, RIPv1/ v2/ng, Multi-Area OSPF, EIGRP, Static Routing, Route Redistribution, Multilayer Switching, L3 QoS, NAT, CBAL , Zone-based policy firewall and Intrusion Protection System on the ISR, GRE VPN, IP Sec VPN |

Table 5.1 Packet Tracer Protocols

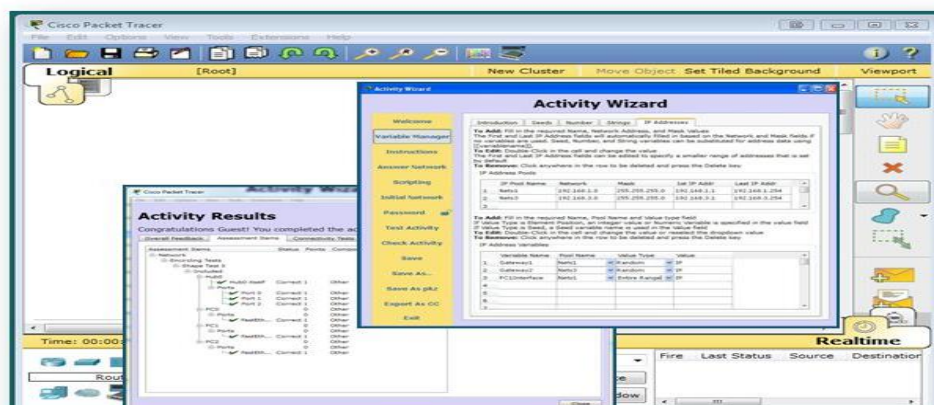
Activity Wizard:

The Activity Wizard permits clients to creator their own learning exercises by setting up situations utilizing instructional content, and making beginning and last organization geographies and predefined packets. The Activity Wizard likewise incorporates reviewing and criticism capacities.



Activity wizard for editing Packet Tracer activities

Activity Wizard for Editing PT Activities



Instructors can localize, edit, or enhance existing activities using the Activity Wizard

Figure 5.3 Activity Wizard

Modular Devices:

Graphical portrayals outwardly recreate equipment and offer the capacity to embed interface cards into measured switches constantly, which at that point become part of the reenactment.

Multiusers Functionality:

Cisco Packet Tracer is an organization competent application, with a multiuser shared mode that permits communitarian development of virtual organizations over a genuine organization. The multiuser highlight empowers energizing community oriented and serious communications, giving the option to advance from individual to social learning and highlights open doors for cooperation, rivalry, far off educator understudy associations, interpersonal interaction, and gaming.

Tutorials:

Packet Tracer incorporates a few essential bit by bit instructional exercises that acclimate clients with the item includes and disclose how to take part in reenactments. Extra progressed instructional exercises are accessible for download from Academy Connection.

Help:

An assistance include is accessible to acquaint clients with the Cisco Packet Tracer interface, capacities, and highlights. The assistance territory incorporates significant notes and tips and gives commented on screen captures to help understanding.

Additional Features

- Lab grading function.
- International language support.
- Compatible with the following platforms: Windows, Windows XP; Vista (Vista Basic, Vista Premium); Windows 7; and Linux (Ubuntu, Fedora).
- Available to registered Networking Academy instructors, students, and alumni.

Packet Tracer Multiuser Functionality

- PT is an organization competent (shared) application, utilizing the real network (TCP attachment associations) with convey the Packet Tracer virtual packets.
- The PT application running on one PC can speak with the PT application running on at least 1 different PCs.
- This availability between different occasions of PT underpins cooperation, homeroom games, joint effort, rivalry, far off teacher understudy collaboration, and long-range informal communication.

Example Multiuser Scenarios

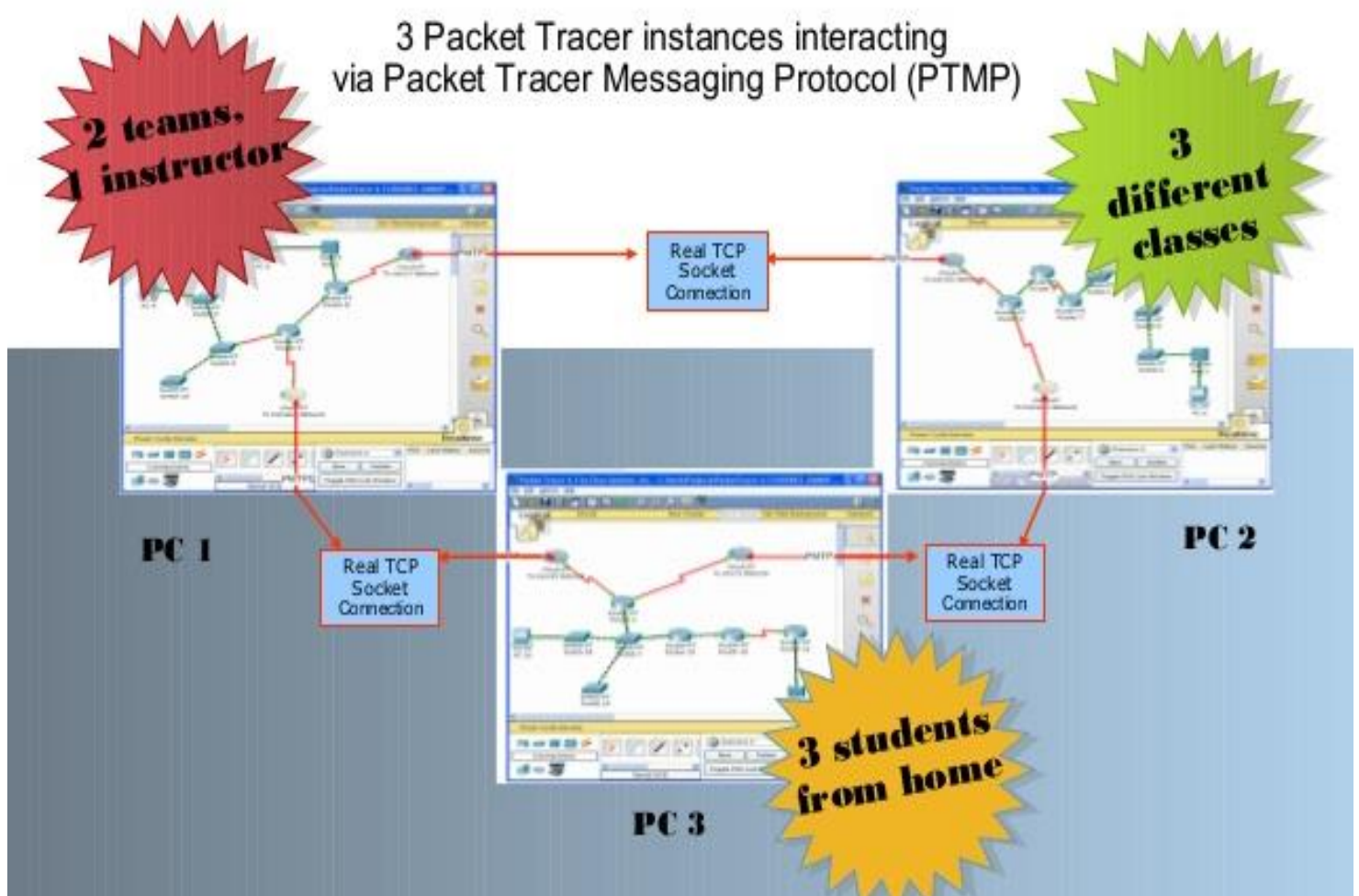


Figure 5.4 Multiuser Feature in Packet Tracer

CHAPTER 06

RESULT AND DISCUSSION

Result we got

We had got some results where we can see temperature, humidity and Water level values. The sprinkler got turned on when temperature is $\geq 30^{\circ}\text{C}$ and Water level is $\leq 30\%$. And the sprinkler got turned off when Water level is $=100\%$.

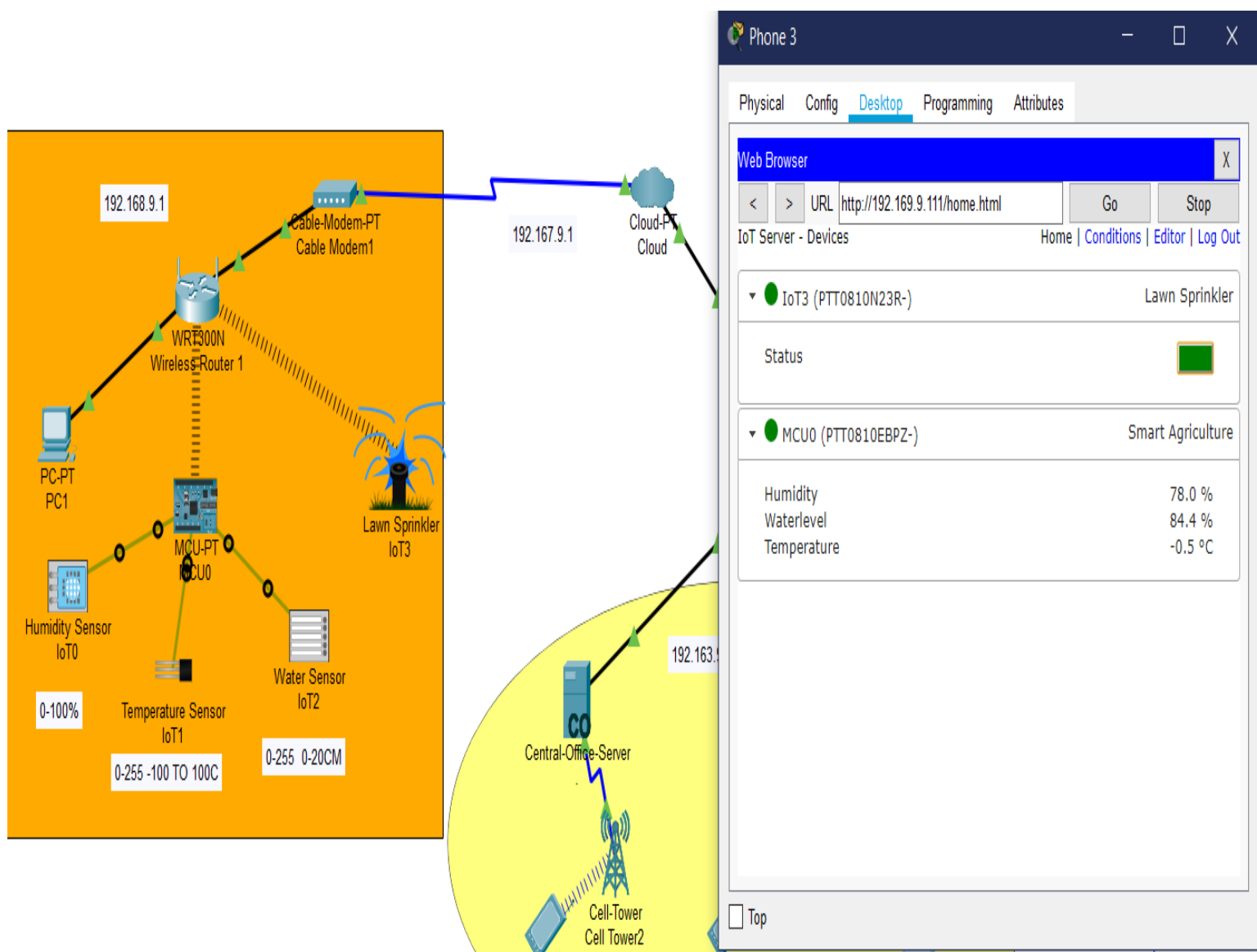


Figure 6.1 Sprinkler Status

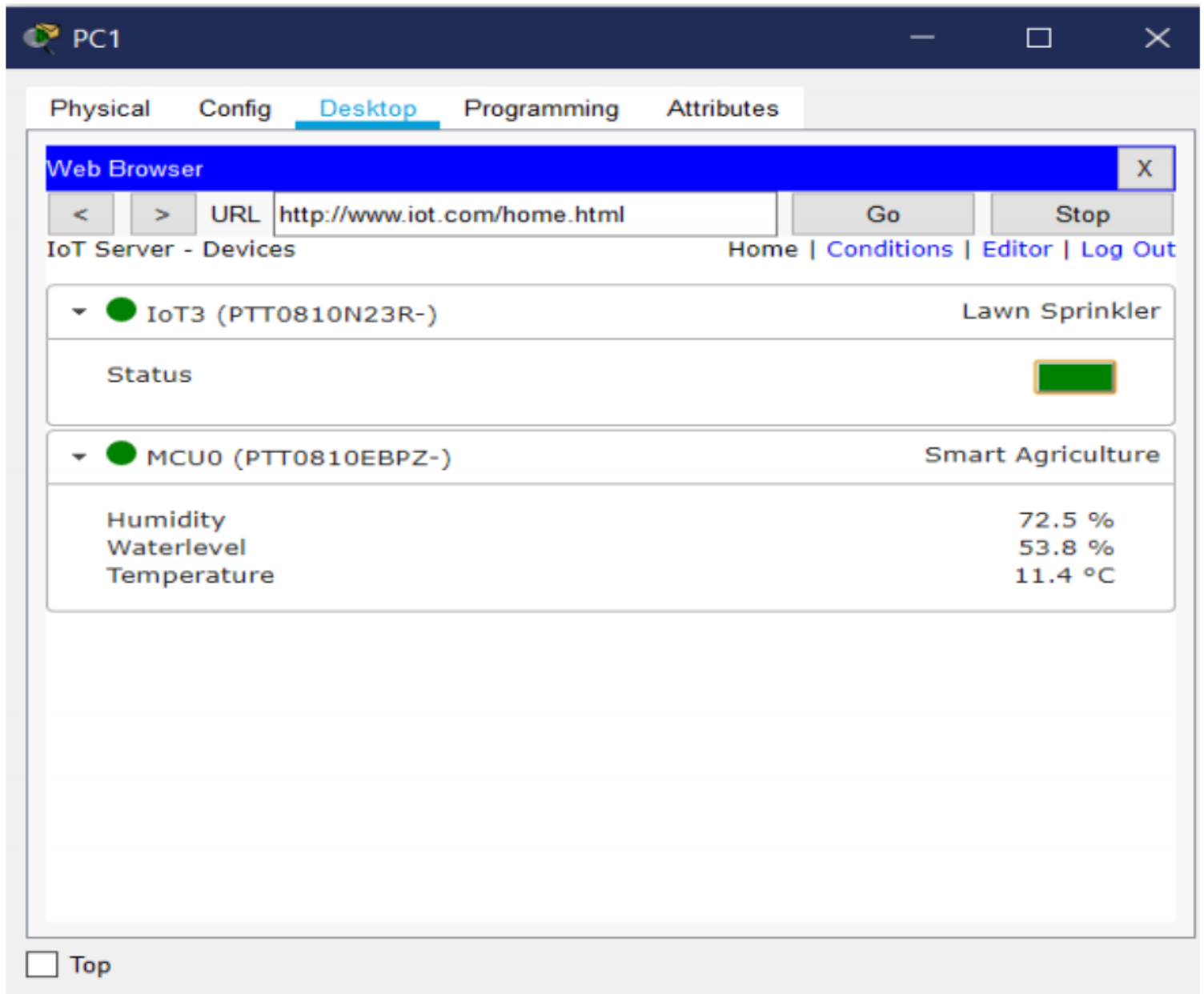


Figure 6.2 Result Window

As we got the output at last and the accuracy is also good. Our team members are gone through some of the papers and they came with the different ideas and were discussed. Then final algorithm and divided the work.

CHAPTER 07

ADVANTAGES AND APPLICATIONS

Advantages

Expanded Production: Optimized crop treatment, for example, exact planting, watering, pesticide application and gathering straightforwardly influences creation rates.

Water Conservation: Weather forecasts and soil dampness sensors take into consideration water utilize just when and where required.

Constant Data and Production Insight: Farmers can picture creation levels, soil dampness, daylight force and more progressively and distantly to quicken dynamic cycle.

Brought down Operation Costs: Automating measures in planting, treatment and reaping can lessen asset consumption, human mistake and generally speaking expense.

Expanded Quality of Production: Analyzing creation quality and results in connection to treatment can instruct ranchers to change cycles to build nature of the item.

Exact Farm and Field Evaluation: Accurately following creation rates by field over the long run takes into account nitty gritty anticipating of future harvest yield and estimation of a homestead.

Improved Livestock Farming: Sensors and machines can be utilized to identify multiplication and wellbeing occasions prior in animals. Geofencing area following can likewise improve domesticated animals observing and the board.

Decreased Environmental Footprint: All preservation endeavors, for example, water use and expanded creation per land unit straightforwardly influence the ecological impression decidedly.

Applications

Harvest Water Management

To perform agribusiness exercises in wasteful way, sufficient water is fundamental. Farming IoT is incorporated with Web Map Service (WMS) and Sensor Observation Service (SOS) to guarantee appropriate water the board for water system and thus decreases water wastage.

Exactness Agriculture

High precision is required will be needed regarding climate data which diminishes the odds of yield harm. Horticulture IoT guarantees convenient conveyance of ongoing information as far as climate guaging, nature of soil, cost of work and considerably more to rancher.

Integra ratted Pest Management or Control (IPM/C)

Horticulture IoT frameworks guarantees ranchers with exact ecological information by means of appropriate live information checking of temperature, dampness, plant development and level of irritations so legitimate consideration can be taken during creation.

Food Production and Safety Agriculture

IoT framework precisely screens different boundaries like stockroom temperature, delivering transportation the executives framework and furthermore coordinates cloud-based account frameworks.

CHAPTER 08

FUTURE SCOPE

- ❖ In the coming years, shrewd cultivating is projected to make a monstrous effect on the agrarian economy by overcoming any issues among little and enormous scope organizations. The pattern isn't just relevant in evolved nations — non-industrial nations have understood its massive significance also.
- ❖ In nations, for example, China and Japan, wide-scale arrangements of cell phones and web of things frameworks have prompted a quick adoption of accuracy agribusiness arrangements. The administrations of a few nations have additionally understood the requirement for, and the upsides of these innovations, and subsequently, their drives to advance accuracy cultivating procedures are relied upon to drive the development of the market further.
- ❖ However, such progressive changes in cultivating rehearses accompany open doors as well as specific difficulties which end up being a limitation in the development of the market. The mindfulness and information about fresher farming innovation are yet to spread widely, particularly in arising nations.
- ❖ Future work would be centered more around expanding sensors on this framework to get more information particularly with respect to Pest Control and by likewise incorporating GPS module in this framework to improve this Agriculture IoT Technology to undeniable Agriculture Precision prepared item.
- ❖ The IoT based shrewd items should have novel personalities, and they ought to have capacities to convey and communicate with one another, and with different elements in the organization, alongside the portable and online stages. Numerous innovations and guidelines have been proposed for specifying IoT vision, and the interoperability of heterogeneous substances is a fundamental test in the region.

CHAPTER 09

CONCLUSION

The proposed model investigates the utilization of IoT (Internet of things) in the agribusiness area. This model targets expanding the harvest yield by aiding in anticipating better harvest succession for a specific soil. IoT helps progressively examining of the dirt and thus the information procured can be additionally utilized for breaking down the harvest. The proposed framework can be utilized to turn on/off the water sprinkler relying upon the dirt dampness level sensor, temperature sensor and furthermore consequently making the cycle less complex to utilize. We have likewise taken numerous readings of the dirt dampness, temperature and stickiness of the climate for different days. Information on the cloud additionally helps the agriculturists in improving the yield, assessing the excrements, disease in the fields. This framework is financially savvy and doable. It additionally centers around optimizing the utilization of water assets which battles issues like water shortage and guarantees supportability. This model spotlights on the use of IoT in horticulture and the arrangements proposed in this Project will improve cultivating strategies, increment profitability and lead to viable utilization of restricted assets.

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4. Cosmin, "Automatic Plant watering system", Year 2011.

Web reference

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APPENDIX

```
function setup()
{
    IoEClient.setup({
        type:"Smart Agriculture",
        states:[
            {
                name:"Humidity",
                type:"number",
                unit : "%",
                decimalDigits:1
            },
            {
                name:"Waterlevel",
                type:"number",
                unit : "%",
                decimalDigits:1
            },
            {
                name:"Temperature",
                type:"number",
                unit : "°C",
                decimalDigits:1
            }
        ]
    });
}

function loop() {
    var Tem = analogRead(A2); //0 -1023
    var Hum = analogRead(A0);
    var Water =analogRead(A1);

    var WaterLevel = map(Water, 0,1023,0,100);
    var Temperature = map(Tem,0,1023,-100,100);
    var Humidity = map(Hum,0,1023,0,100);

    Serial.println(WaterLevel);
    Serial.println(Temperature);
    Serial.println(Humidity);
    IoEClient.reportStates([Humidity, WaterLevel, Temperature]);
    delay(1000);}

```