

Smart Irrigation System using Cisco Packet Tracer

Industrial Internet of Things Internship

By Yogeshwari.K

1. Aim

To design a smart irrigation system that monitors soil moisture and automatically irrigates the field using Cisco Packet Tracer IoT simulation.

2. Problem Statement

Traditional irrigation systems often lead to water wastage due to manual operation and lack of real-time monitoring. There is a need for an automated system that can:

- i. Monitor the soil moisture in real-time.
- ii. Trigger irrigation only when necessary.
- iii. Reduce human intervention and conserve water resources.

This project aims to simulate such a smart irrigation system using Cisco Packet Tracer, integrating IoT concepts.

3. Scope of the Solution

Automation: Automatically switches on/off irrigation based on soil moisture.

Real-time monitoring: Uses sensors to continuously monitor field conditions.

Scalability: The solution can be scaled to cover larger agricultural areas.

IoT Simulation: Built entirely using Cisco Packet Tracer without physical hardware.

4. Overview / Architecture of the Solution

Water Level Detection

The Water Level Monitors (water monitor 1 & 2) constantly measure the moisture level in the soil.

These sensors are wirelessly connected to the Home Gateway (IoT Gateway).

Communication to Gateway

If the water level is below a threshold, the monitors send a signal to the Home Gateway.

Activation of Sprinklers

Based on the data received, the Home Gateway sends commands to appropriate Lawn Sprinklers (sprinkler 1 to 4) to turn ON or OFF.

In your image, Sprinkler 3 and Sprinkler 4 are active (spraying water), indicating a dry area detected.

User Control via Smartphone

The Smartphone0 connects to the Home Gateway to:

Monitor sensor readings

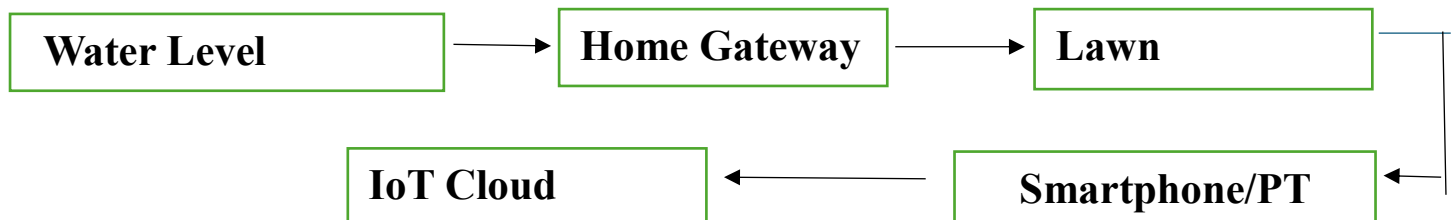
Override automatic settings manually

Schedule irrigation times

Advantages of This Setup

- **Automated Watering:** Reduces human effort and ensures timely watering.
- **Water Efficiency:** Prevents over-watering by checking real-time soil conditions.
- **Remote Monitoring:** Users can manage irrigation from anywhere.
- **Scalability:** Easy to add more sensors or sprinklers if needed

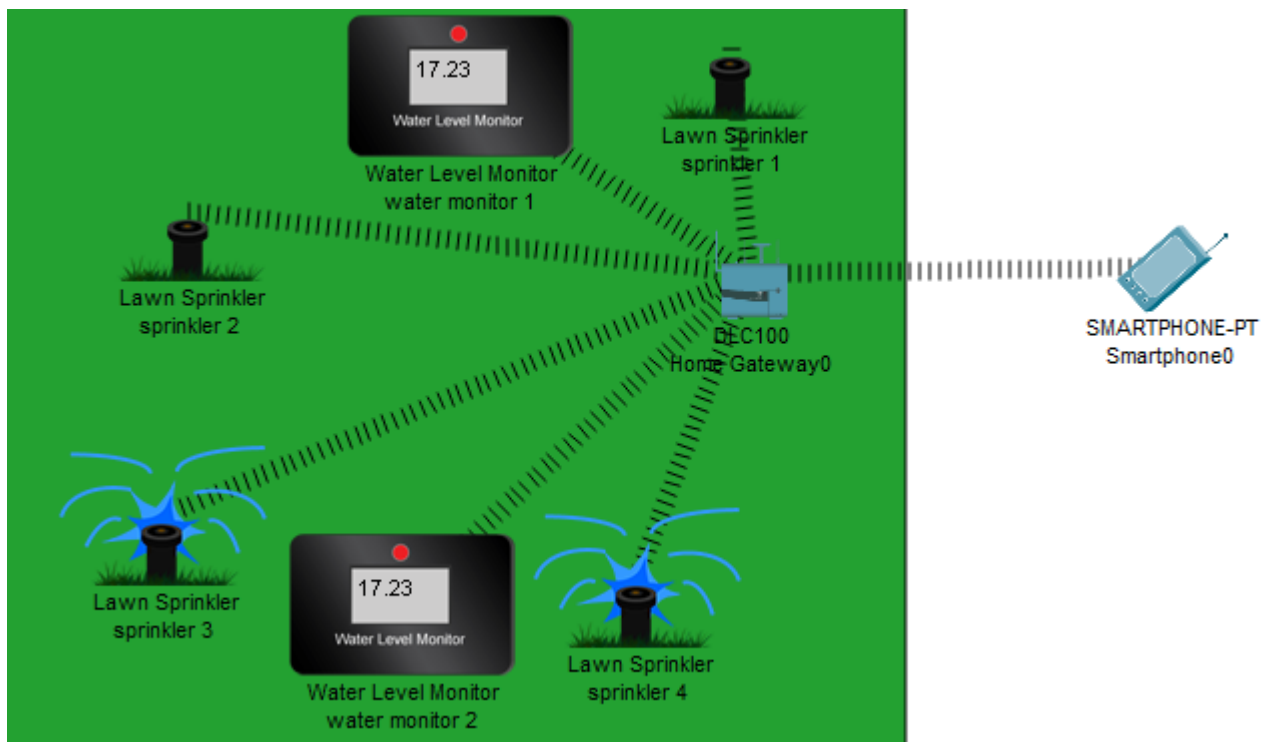
System Flow:



5. Required Components

- Water Level Monitor (Sensor)
- Lawn Sprinklers (Actuators)
- Home Gateway (Router)
- Smartphone (Remote Control)
- Wireless communication lines

6. Simulated Circuit Screenshot



7. Execution Demo (Video)

<https://github.com/yogaa104/smart-water-irrigation.git>