AIM

To design and simulate a smart irrigation system capable of monitoring soil moisture levels and automatically triggering irrigation to optimize water usage using Cisco Packet Tracer.

PROBLEM STATEMENT

Traditional irrigation methods often lead to overwatering or underwatering, wasting water and reducing crop yield. A smart irrigation system is needed to automate the water supply by monitoring soil moisture levels and providing water only when necessary. We can use Cisco Packet Tracer to simulate an IoT-based solution to demonstrate optimized water usage in agricultural fields.

SCOPE OF THE SOLUTION:

- Monitor real-time soil moisture levels using virtual IoT sensors.
- Automatically control water pumps/valves based on soil moisture data.
- Reduce water wastage and increase the efficiency of agricultural irrigation.
- Provide a scalable IoT-based model that can be extended to real-world deployment.
- Simulation using Cisco Packet Tracer for proof of concept.
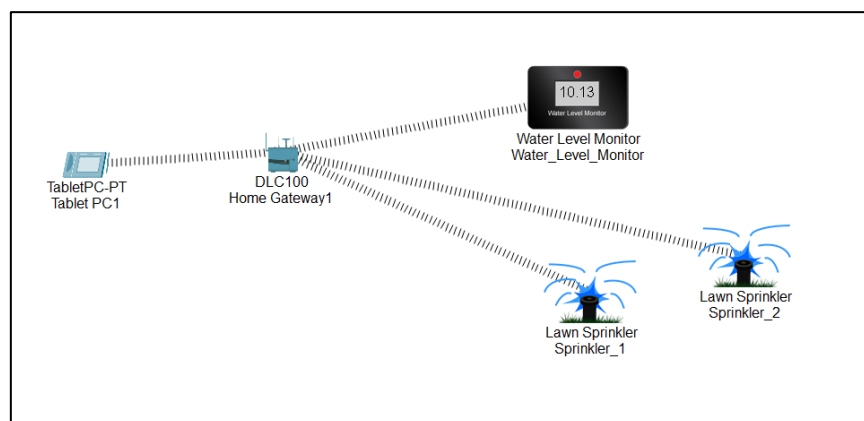
COMPONENTS REQUIRED

Software / IDE:

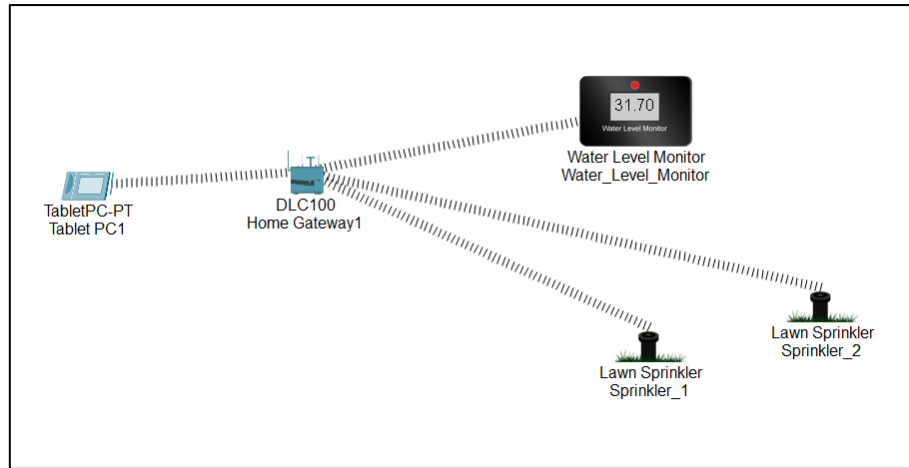- Cisco Packet Tracer (IoT Simulation Environment)

Hardware (Simulated in Cisco Packet Tracer):

- Soil Moisture Sensor (IoT device in Packet Tracer)
- Smart Irrigation Pump / Water Sprinkler (actuator)
- Home Gateway (IoT Gateway in Packet Tracer)
- Cloud Server (optional, for monitoring)

SIMULATED CIRCUIT

Condition: Water_Level_Monitor>=13 –> Lawn Sprinklers ON

Condition: Water_Level_Monitor<30 –> Lawn Sprinklers OFF

RESULT

The smart irrigation system was successfully simulated in Cisco Packet Tracer. The water level sensor controlled the sprinklers automatically based on defined conditions. This confirms efficient water usage through IoT-based automation.