UNIVERSITY OF ENGINEERING AND TECHNOLOGY, PESHAWAR

DEPARTMENT OF COMPUTER SYSTEMS ENGINEERING

CSE-303L DATA COMMUNICATION AND NETWORKS LAB

PROJECT REPORT

Submitted to:

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Date: 02-07-2025

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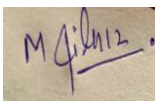
Class Section: **A**

Sign: 

Home Devices Connection with IoT Server using Packet Tracer:

Introduction:

The project showcases a **smart home automation system** designed in **Cisco Packet Tracer**, where IoT-enabled devices (fan, AC, garage, door, light, humidity sensor) are connected to an **IoT server** via a network consisting of a **router, switch, and end-user devices** (PCs, laptops, and smartphones). The system allows users to monitor and control home appliances remotely through a **web-based dashboard**, enhancing convenience, energy efficiency, and security.

Objectives:

1. **Network Design**: Configure a functional home network with a **router, switch, IoT server, and smart appliances**.
2. **IoT Integration**: Register and control devices (fan, AC, door, light, sensor) via the **IoT server dashboard**.
3. **Remote Access**: Enable users to interact with appliances through a **web interface** from any connected device.
4. **Real-Time Monitoring**: Display live status (ON/OFF, speed, lock state, humidity levels) for all connected devices.

Implementation:

Network Setup (Based on Provided Image)

1. **Devices Used**:
    - **Router**: Connects the home network to the internet (simulated in Packet Tracer).
    - **Switch**: Links all IoT devices and user endpoints.
    - **IoT Server**: Hosts the web interface (http://10.1.2.2/home.html) for device control.

- **Appliances**:
    - **Fan**: Adjustable speed (Low/High).
    - **AC**: ON/OFF control.
    - **Door/Garage**: Open/Close and Lock functionality.
    - **Light**: Dimmer and ON/OFF switch.
    - **Humidity Sensor**: Real-time readings (e.g., 63%).
- **User Devices**: PC, Laptop, Smartphone (for accessing the dashboard).

2. **IP Configuration**:
    - IoT Server: 10.1.2.2 (as seen in the image).
    - Devices are assigned IPs within the same subnet for communication.
3. **IoT Server Dashboard (From Image)**:
    - **URL**: http://10.1.2.2/home.html (accessible via browser).
    - **Features**:
        - Toggle switches for appliances (e.g., Fan speed, AC power).
        - Status indicators (e.g., "Open" for doors, "63" for humidity).
        - Lock controls for doors/garage.
4. **Device Registration**:
    - Each appliance is registered with a unique ID (e.g., PTT0810101U for the Fan).

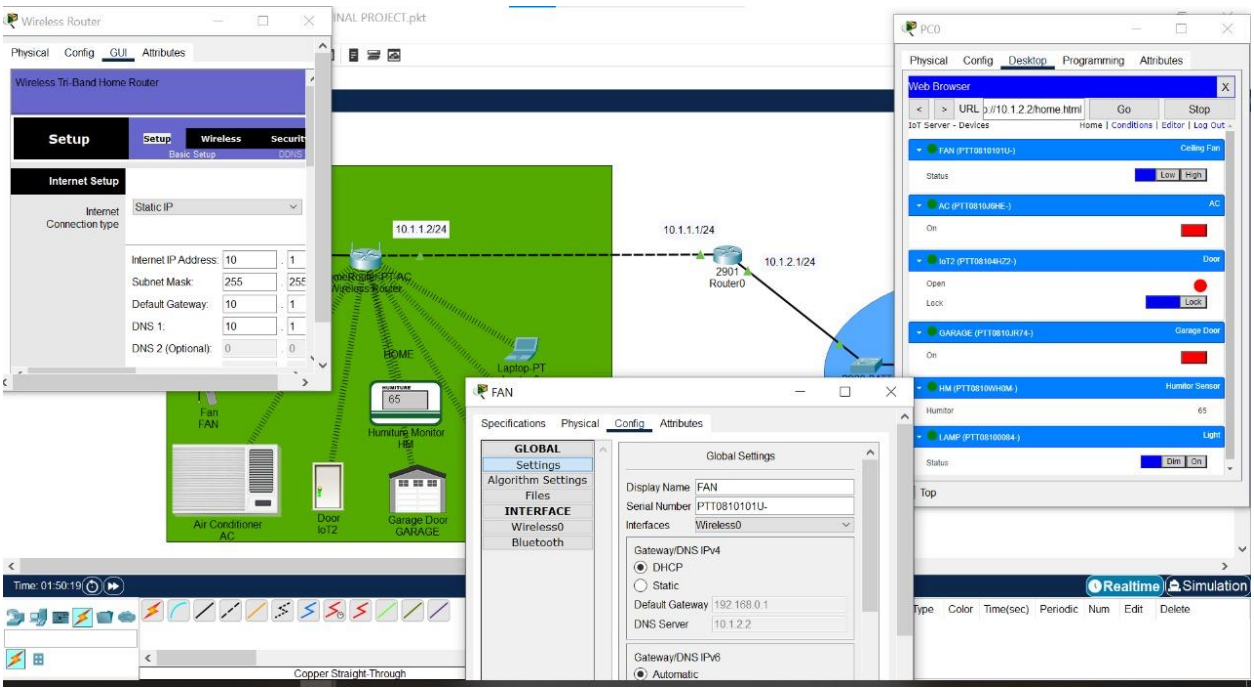
Working:

1. **User Access**:
    - A user opens a browser on a PC/laptop/smartphone and navigates to http://10.1.2.2/home.html.
2. **Control & Monitoring**:
    - **Fan**: Switch between Low/High speed.
    - **AC**: Turn ON/OFF.
    - **Door/Garage**: Lock/Unlock or Open/Close.
    - **Light**: Adjust brightness or toggle power.
    - **Humidity Sensor**: Displays live data (e.g., "Humidity: 63%").

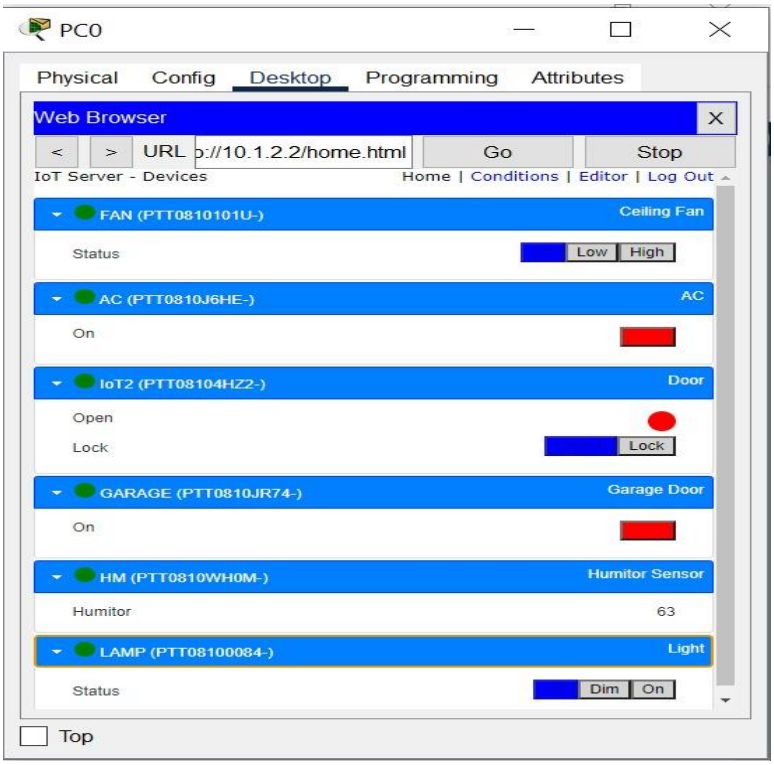
3. **Real-Time Updates**:

   - The IoT server logs all actions (e.g., "Garage Door: Locked") and reflects changes instantly on the dashboard.

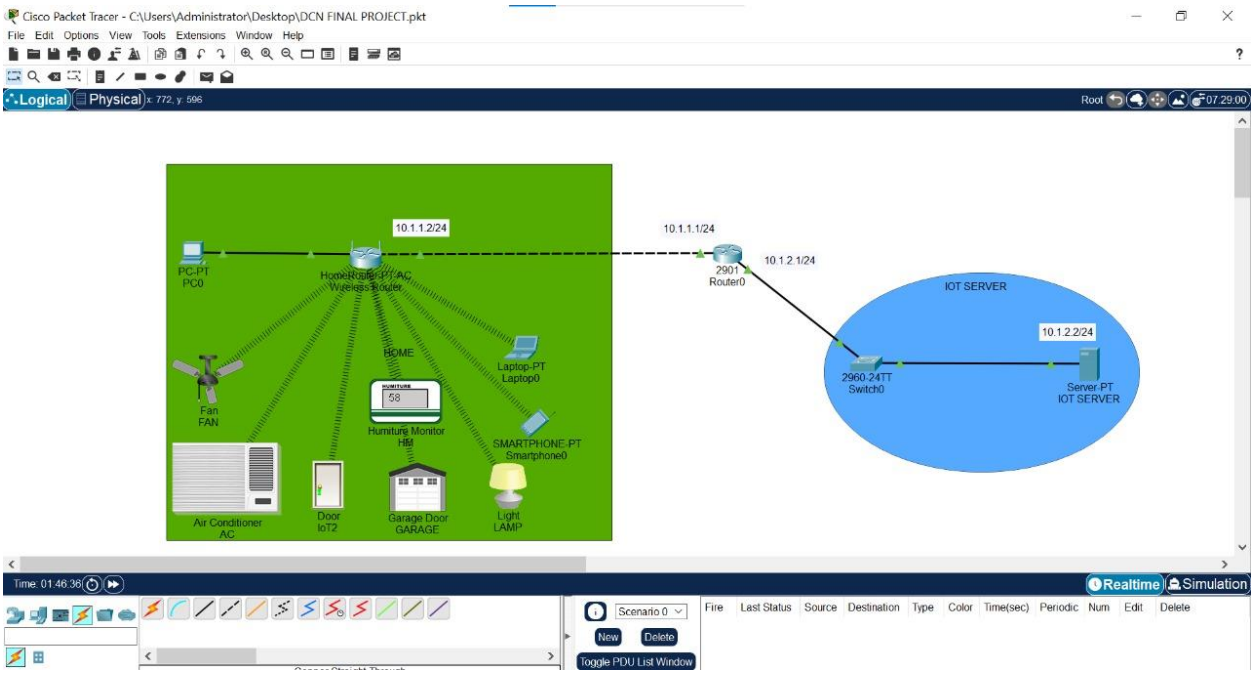
When it is setup for the FAN



A desktop interface for all the home appliances.



Project interface:



Conclusion:

This project successfully demonstrates a **smart home IoT ecosystem** in Packet Tracer, featuring:

- A scalable network with **router, switch, and IoT server**.
- **Web-based control** of appliances via an intuitive interface.
- **Real-time feedback** for seamless user interaction.

THE END