
 Marwadi University	Marwadi University Faculty of Technology Department of Information and Communication Technology	
Subject: Mobile and pervasive Computing (01CT0716)	Aim: Automation Project Lab using Motion Detector, Webcam and Wireless Router	
Task 7	Date: 24/10/2023	Enrolment No: 92110133013

Aim: Automation Project Lab using Motion Detector, Webcam and Wireless Router

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1. Project Objective

The Objective of my project is to establish of the Wireless connectivity and its security also with the help of some Iot devices in cisco packet tracer, and this project is done with the simulation tool, server, router, mobile, tablet, motion detector, webcam and etc. The project aim to create a small wireless network in the lab or class room with security.


2. Equipment and Software

2.1 Hardware Components

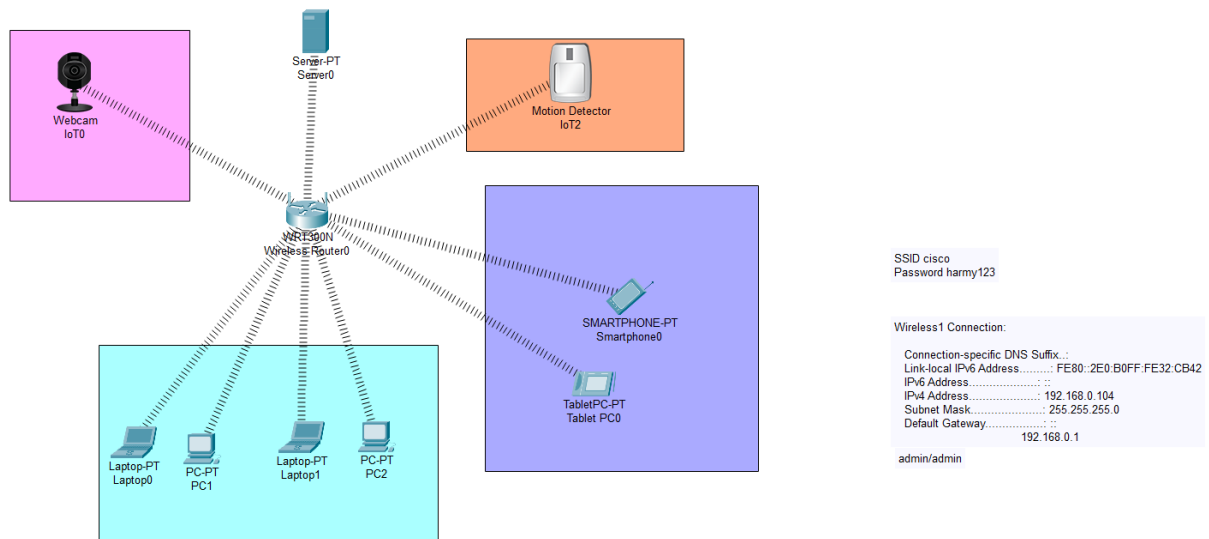
- Server
- Router
- PC
- Laptop
- Phone
- Tablet
- Webcam
- Motion Detector

2.2 Software Components

- Packet Tracer (version 7.3 or later)

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3. Network Topology




4. Implementation

4.1 Configure Wireless Router

- Take one Wireless Router (Wi-fi Router)
- Take laptop or pc's with wi-fi interface

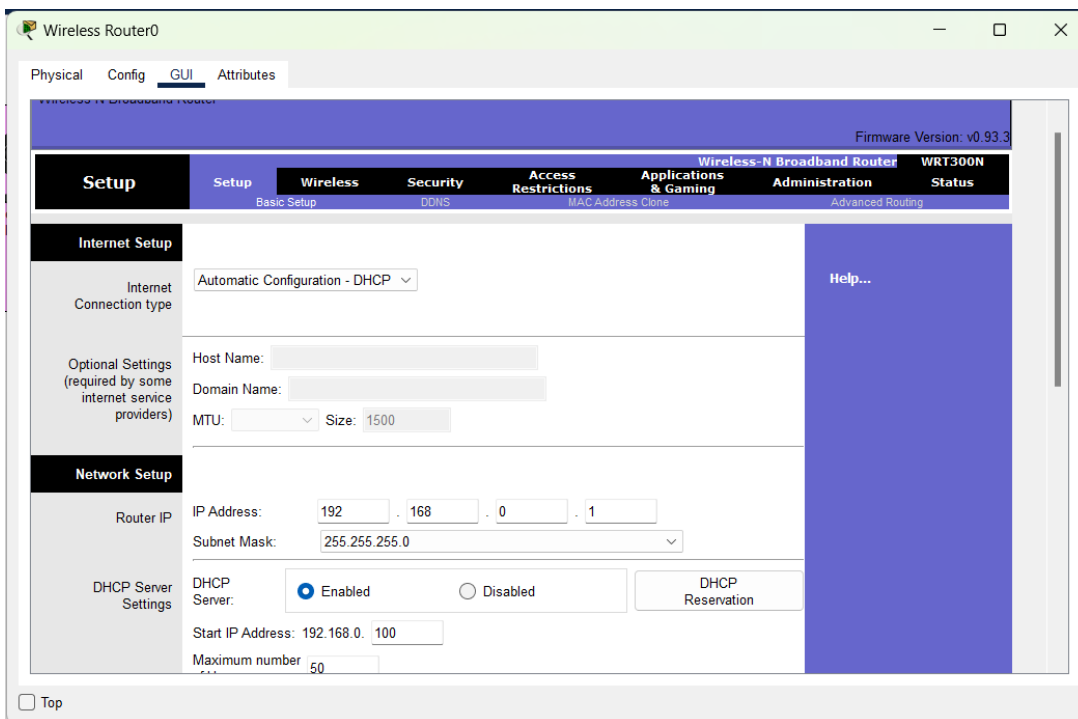
4.2 Configure Security of wi-fi Router

- To make wireless router secure Give ID and Password

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For This:

- Go in router GUI, change in Internet Connection Type and select Automatic Configuration



Wireless Router0

Physical Config **GUI** Attributes

Firmware Version: v0.93.3

Setup Setup **Wireless** Security Access Restrictions Applications & Gaming Administration Status

Basic Setup DDNS MAC Address Clone Advanced Routing

Internet Setup

Internet Connection type: Automatic Configuration - DHCP

Optional Settings (required by some internet service providers):

Host Name:

Domain Name:

MTU: Size: 1500

Network Setup


Router IP: IP Address: 192 . 168 . 0 . 1 Subnet Mask: 255.255.255.0

DHCP Server Settings: DHCP Server: ☒ Enabled ☐ Disabled DHCP Reservation

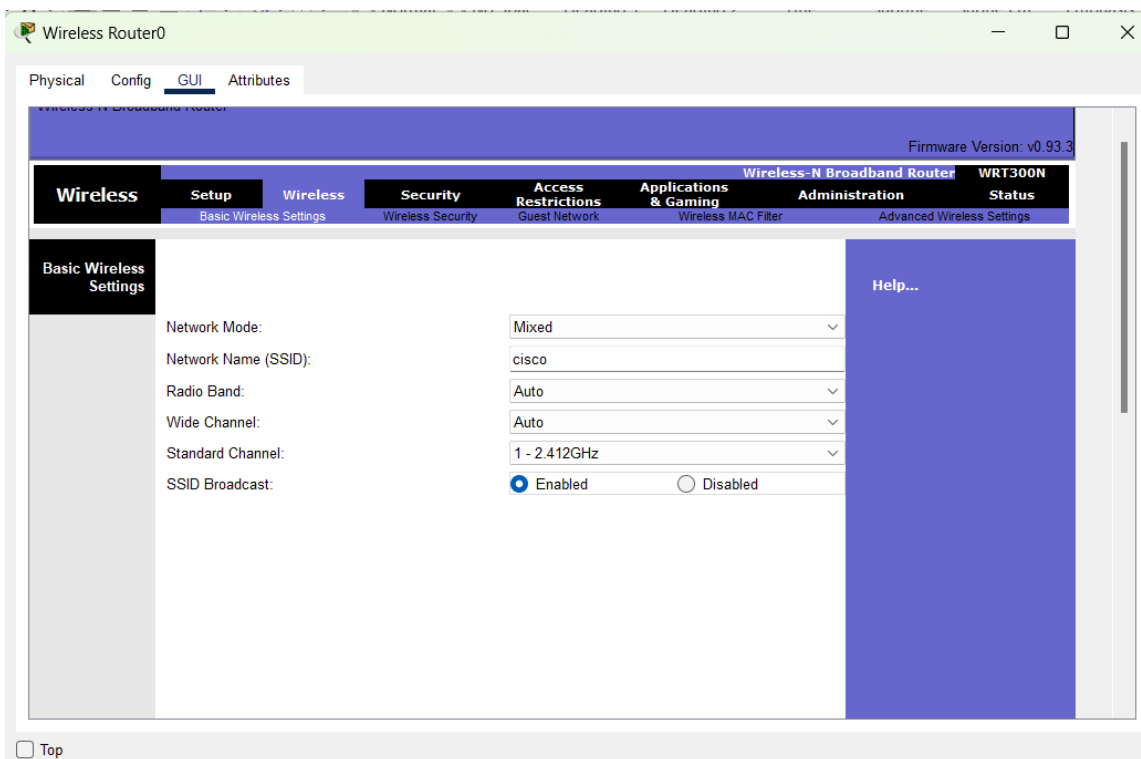
Start IP Address: 192.168.0.100

Maximum number: 50

☐ Top

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- Give network name like cisco



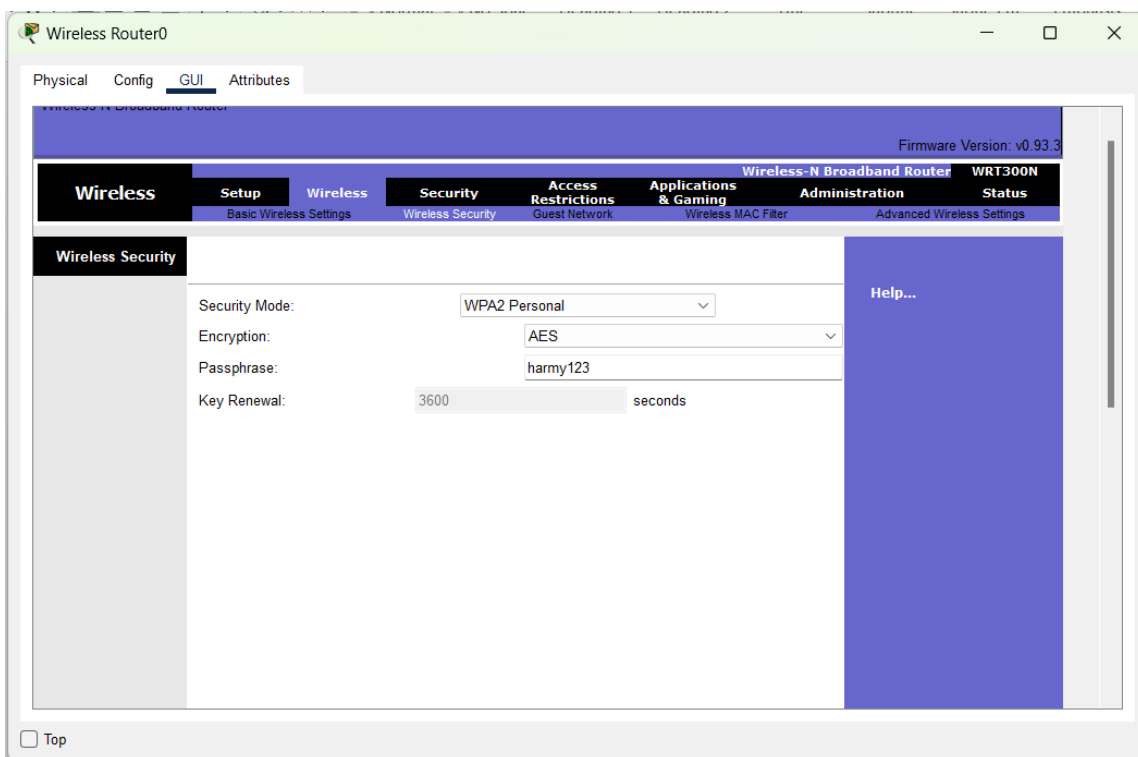
The screenshot shows the configuration page for a Wireless Router0. The interface has a top navigation bar with tabs: Physical, Config, GUI (selected), and Attributes. Below this is a sub-navigation bar for the Wireless section, with options: Setup (selected), Wireless, Security, Access Restrictions, Applications & Gaming, Administration, and Status. The main content area is titled 'Basic Wireless Settings' and contains the following configuration options:


- Network Mode: Mixed (dropdown menu)
- Network Name (SSID): cisco (text input)
- Radio Band: Auto (dropdown menu)
- Wide Channel: Auto (dropdown menu)
- Standard Channel: 1 - 2.412GHz (dropdown menu)
- SSID Broadcast: ☒ Enabled ☐ Disabled

A 'Help...' link is visible on the right side of the configuration area. At the bottom left, there is a 'Top' link.

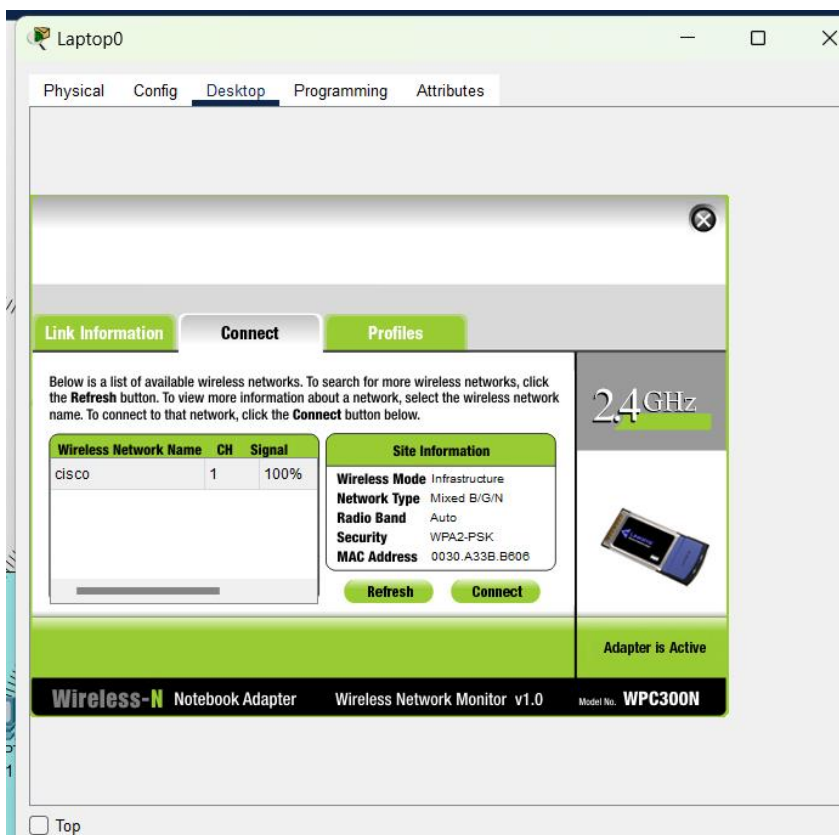
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- Give Password like army123



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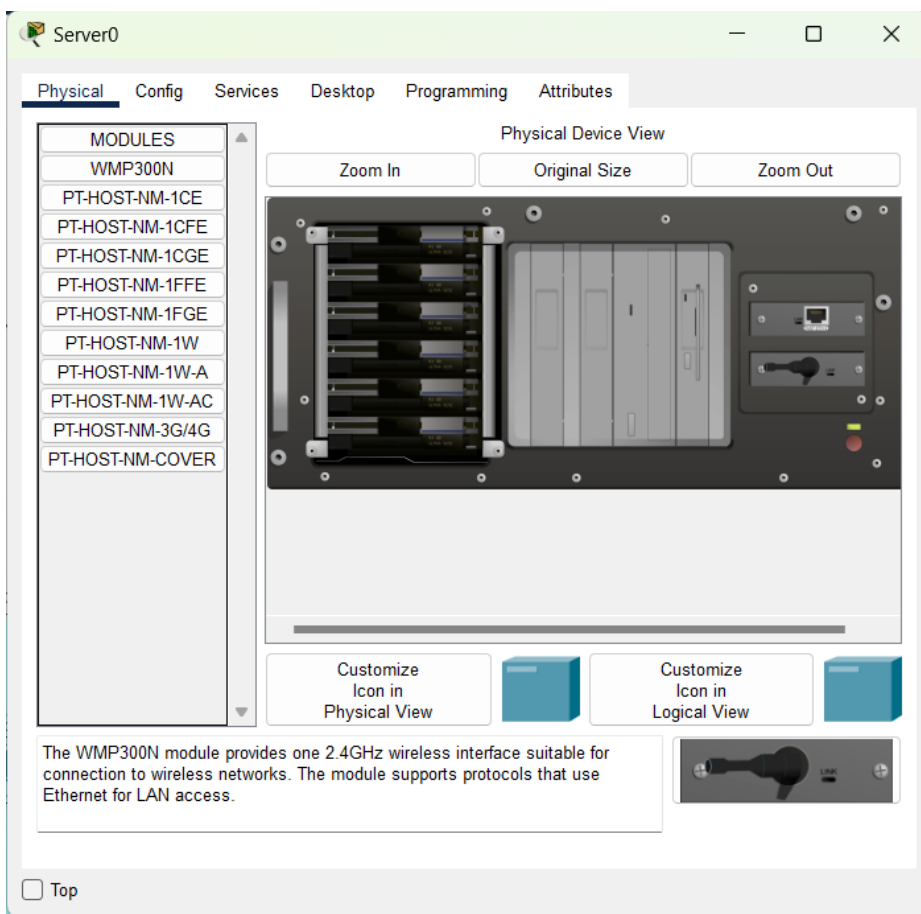
- And now if you want to connect any devices with router so first you need to enter password and connect any devices. (for security purpose)




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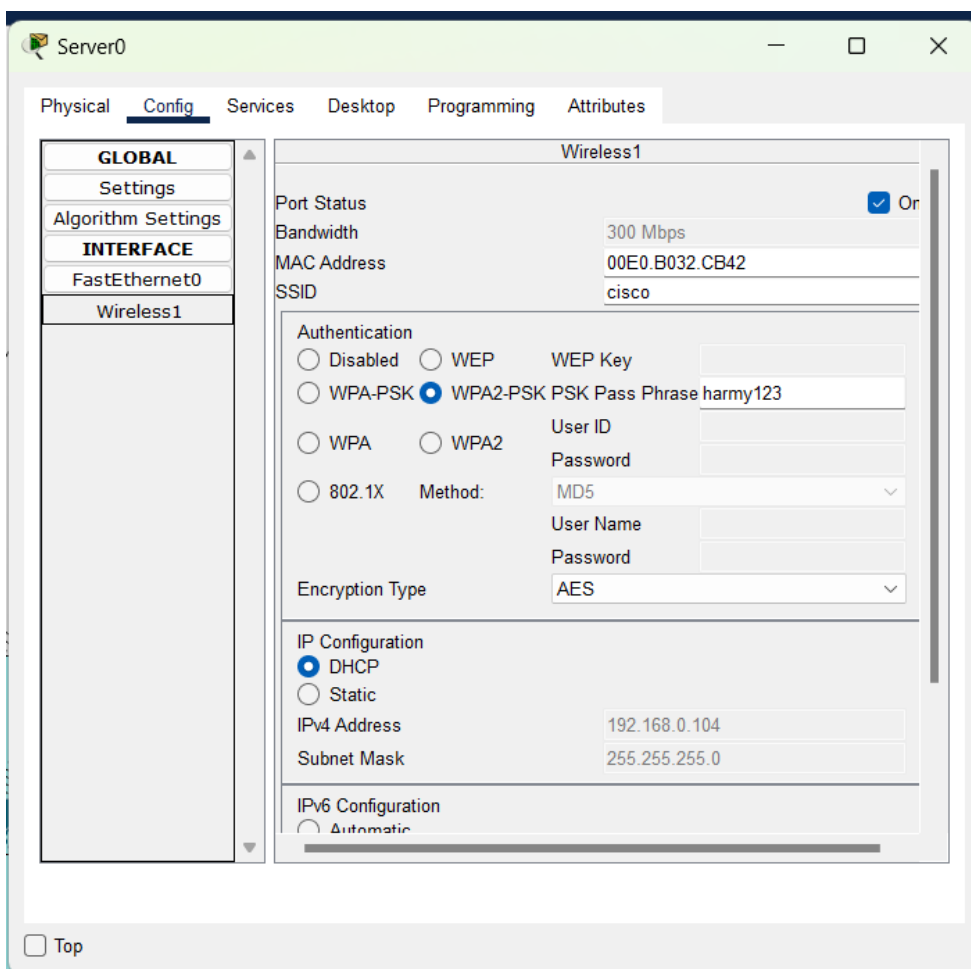
4.3 Configure Server

- For connect server with wi-fi add single band router



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- And then give SSID and Password on the Server



Server0

Physical Config Services Desktop Programming Attributes

GLOBAL

- Settings
- Algorithm Settings

INTERFACE

- FastEthernet0
- Wireless1**

Wireless1

Port Status ☒ Or

Bandwidth 300 Mbps

MAC Address 00E0.B032.CB42

SSID cisco

Authentication

☐ Disabled ☐ WEP WEP Key

☐ WPA-PSK ☒ WPA2-PSK PSK Pass Phrase army123

☐ WPA ☐ WPA2 User ID

☐ 802.1X Method: MD5 Password

User Name

Password

Encryption Type AES

IP Configuration

☒ DHCP

☐ Static


IPv4 Address 192.168.0.104

Subnet Mask 255.255.255.0

IPv6 Configuration

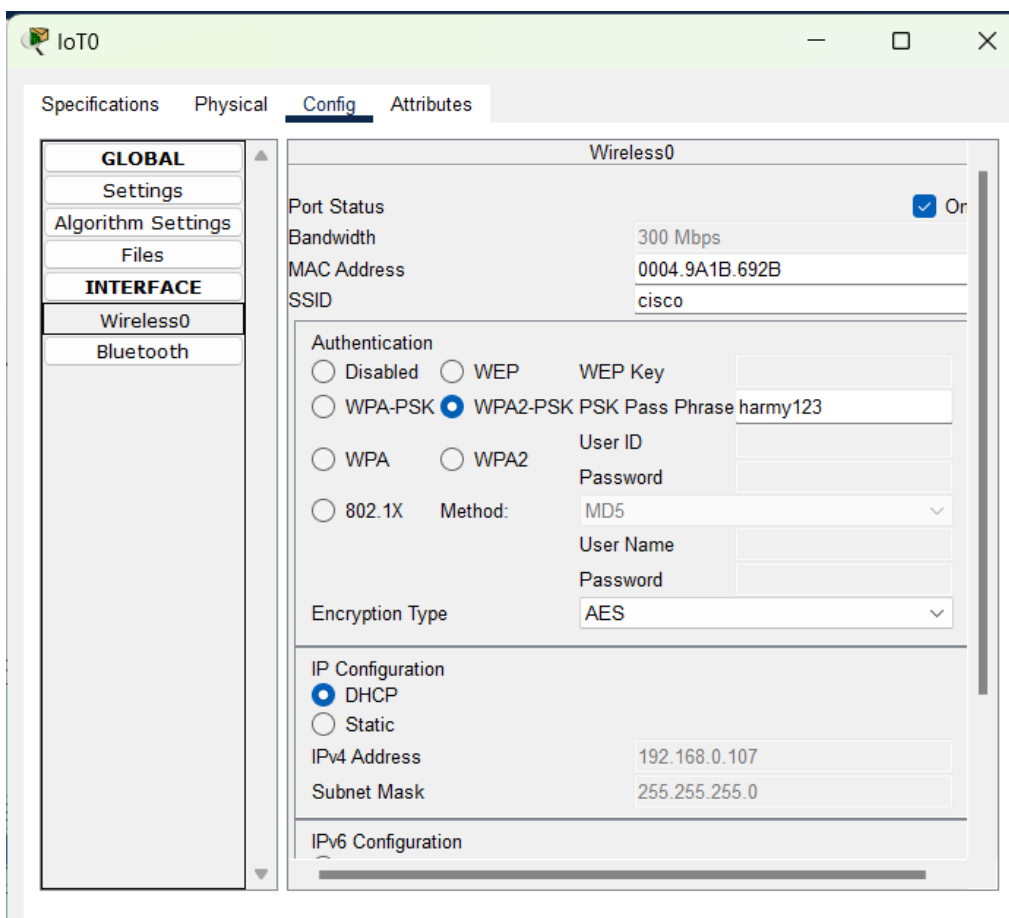
☐ Automatic

☐ Top

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4.4 Set up IoT Devices


- Now connect motion detector and web cam with wi-fi



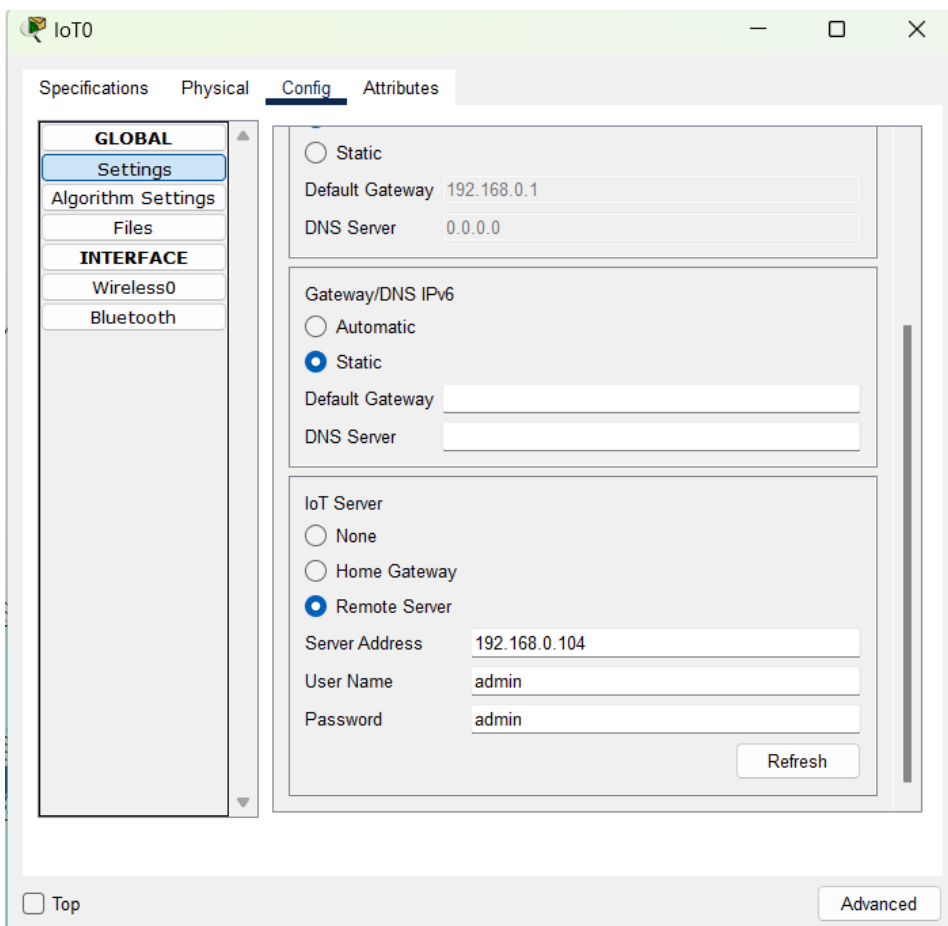
The screenshot shows the configuration interface for an IoT device, specifically the 'Wireless0' interface. The window has tabs for 'Specifications', 'Physical', 'Config', and 'Attributes', with 'Config' currently selected. On the left, there is a sidebar with 'GLOBAL' and 'INTERFACE' sections. Under 'INTERFACE', 'Wireless0' is selected. The main area displays the configuration for 'Wireless0'.

Wireless0 Configuration:

- Port Status:** ☒ On
- Bandwidth:** 300 Mbps
- MAC Address:** 0004.9A1B.692B
- SSID:** cisco
- Authentication:**
 - ☐ Disabled
 - ☐ WEP
 - ☒ WPA-PSK
 - ☐ WPA2-PSK
 - ☐ WPA
 - ☐ WPA2
 - ☐ 802.1X
- WEP Key:** [Empty field]
- PSK Pass Phrase:** harmy123
- User ID:** [Empty field]
- Password:** [Empty field]
- Method:** MD5
- User Name:** [Empty field]
- Password:** [Empty field]
- Encryption Type:** AES
- IP Configuration:**
 - ☒ DHCP
 - ☐ Static
- IPv4 Address:** 192.168.0.107
- Subnet Mask:** 255.255.255.0
- IPv6 Configuration:** [Empty field]

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- To connect webcam and motion detector with server (Add server address ,username and password)




The screenshot shows the 'IoT0' configuration window with the 'Config' tab selected. The left sidebar has a tree view with 'GLOBAL' (containing 'Settings', 'Algorithm Settings', 'Files') and 'INTERFACE' (containing 'Wireless0', 'Bluetooth'). The 'Settings' option is selected. The main area shows the following configuration:

- Static** (selected radio button)
- Default Gateway: 192.168.0.1
- DNS Server: 0.0.0.0
- Gateway/DNS IPv6**
 - Static** (selected radio button)
 - Default Gateway: [empty field]
 - DNS Server: [empty field]
- IoT Server**
 - Remote Server** (selected radio button)
 - Server Address: 192.168.0.104
 - User Name: admin
 - Password: admin
 - [Refresh button]

At the bottom, there is a 'Top' button and an 'Advanced' button.

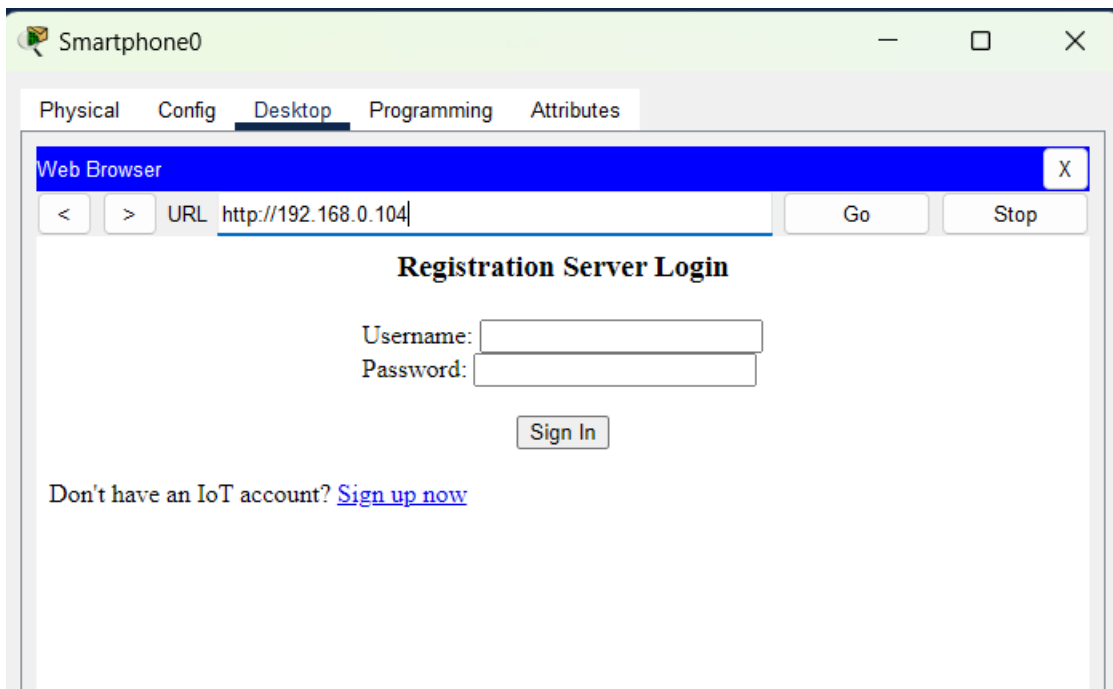
- And now all the devices are connected with same network
- This network is take ip address automatically with the help of DHCP
- Server ip is 192.168.0.104
- Router ip is 192.168.0.1


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- To monitor all this things in smart phone

For that,

- Go in web browser and create account and type username and password



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- And here you can give the conditions based on the requirements.

Smartphone0

Physical
Config
Desktop
Programming
Attributes


Web Browser
X

<
>
URL
http://192.168.0.104/conditions.html
Go
Stop

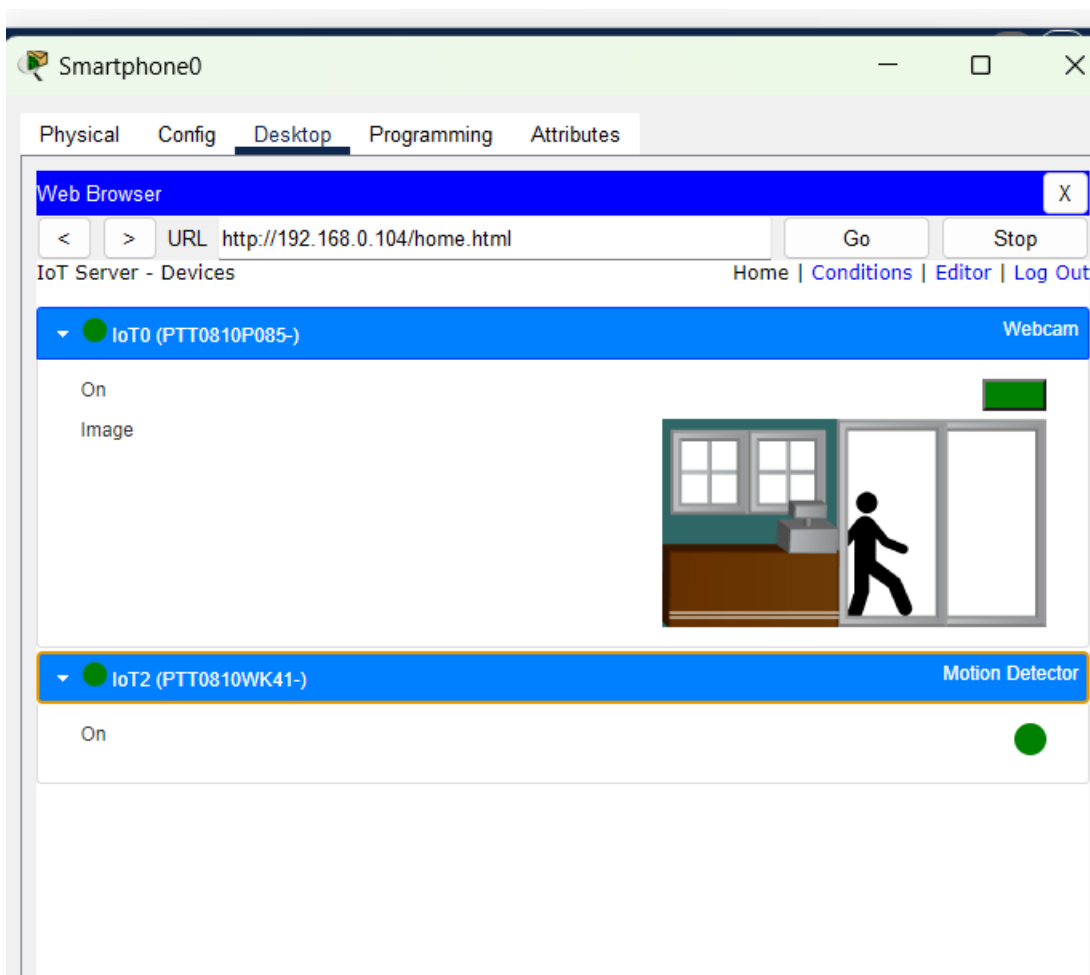
IoT Server - Device Conditions
Home | Conditions | Editor | Log Out


Actions		Enabled	Name	Condition	Actions
Edit	Remove	Yes	camara on	IoT2 On is true	Set IoT0 On to true
Edit	Remove	Yes	camara off	IoT2 On is false	Set IoT0 On to false

Add

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- Last Check the output (if motion is detected than webcam is on otherwise off)

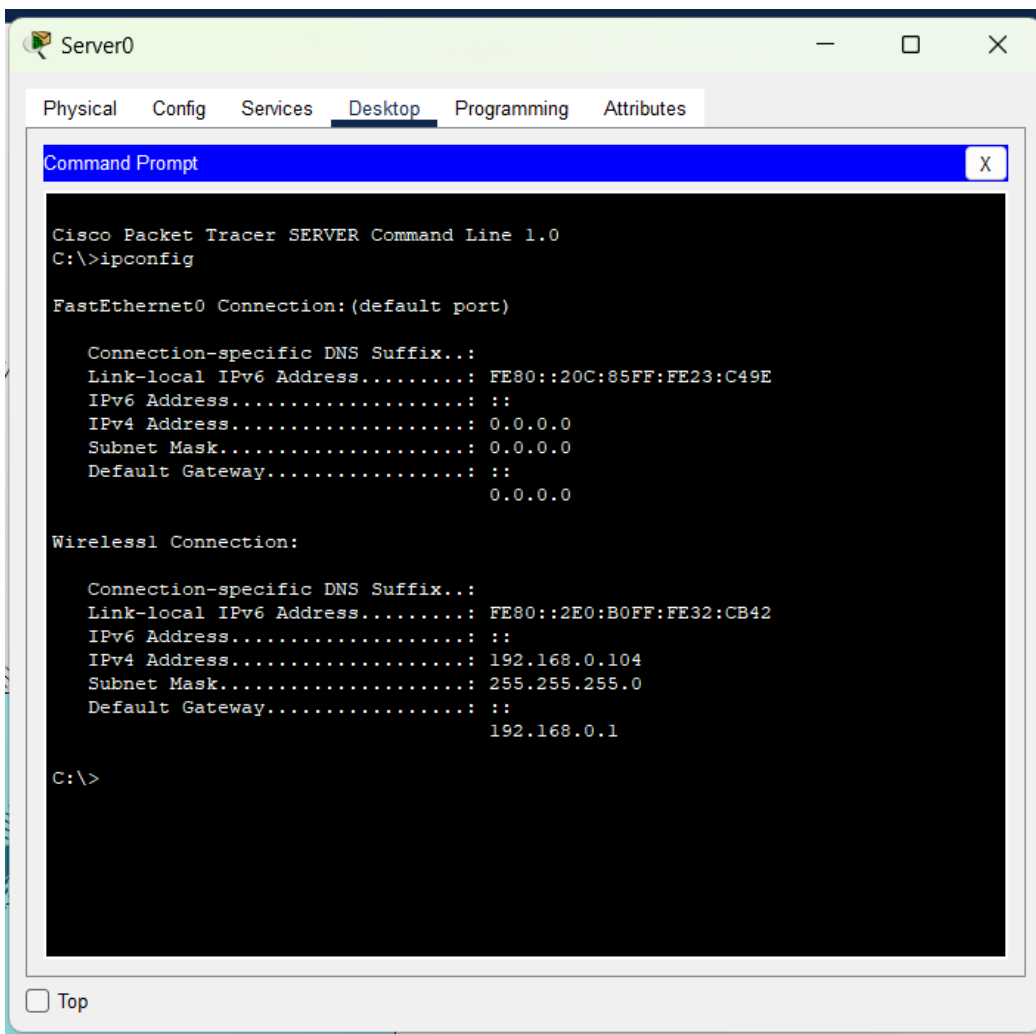


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5. Testing and Troubleshooting

5.1 Connectivity Testing

- Check all the pc's are connected with the server or not
- To check ip address are assigned automatically or not



```

Cisco Packet Tracer SERVER Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection: (default port)


    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: FE80::20C:85FF:FE23:C49E
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 0.0.0.0
    Subnet Mask . . . . .: 0.0.0.0
    Default Gateway . . . . .: ::
                                0.0.0.0

Wireless1 Connection:

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: FE80::2E0:B0FF:FE32:CB42
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 192.168.0.104
    Subnet Mask . . . . .: 255.255.255.0
    Default Gateway . . . . .: ::
                                192.168.0.1

C:\>

```

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6. Conclusion

From this project I conclude that we can add some security this in router like password and also you can add some ip address to connect with router. You can also block the user so that they cannot use our wi-fi. And all the devices connect with the same network and for monitoring this things with same network you can use smart phone also.

7. Future Enhancements

In future in this project you can add many more devices for the security purpose and you can also create large network and add the ip address in router GUI and then use this wi-fi.



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