

Name:

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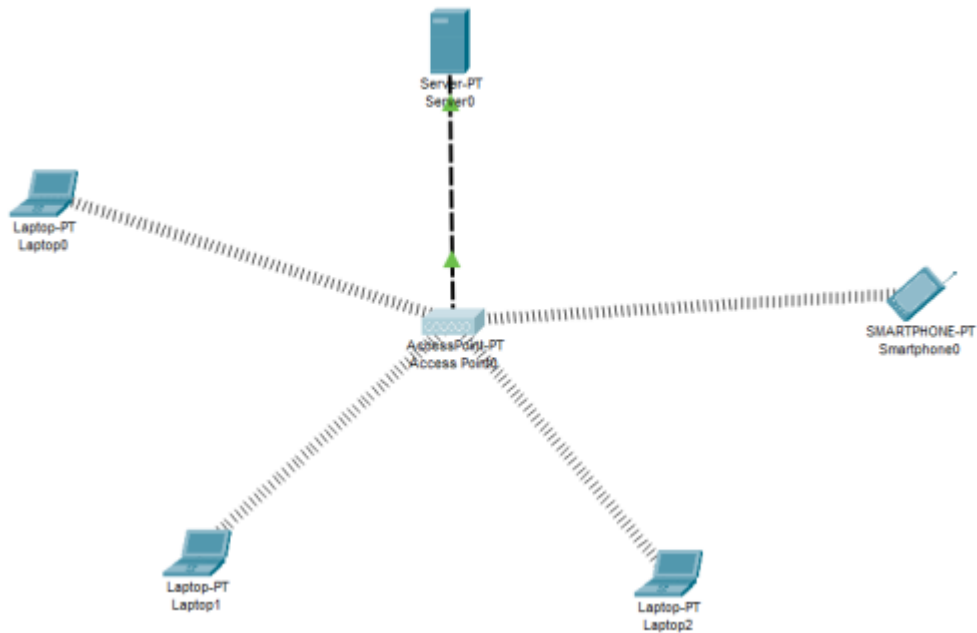
Section:

BSCS-5B

FAST NUCES PWR

Computer networks lab #07

## Task#01: WLAN Configuration on Packet Tracer



By default laptops has classic Ethernet card. To involve in a wireless network, we should have wireless interface card. So, in each laptop, we should turn off the laptop, remove the classical Ethernet, instead of it we place Wireless Interface Card (WPC300N). Then, we power on the laptop again.



After DHCP Services configuration on DHCP Server, we will configure one more thing on this DHCP Server. This is the IP address and subnet mask of the Server. Here, our Servr IP address will be 172.16.0.1 and the mask will be 255.255.255.0.

Server0

Physical Config Services **Desktop** Programming Attributes

**IP Configuration**

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.1

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address

Link Local Address FE80::20C:85FF:FE7B:9D76

We will check the IP addresses of the laptops. For now, checking only one of them is enough. Because, at the beginning if there is no Static IP Configuration and no DHCP, an IP from a special block is assigned to the devices. This is APIPA (Automatic Private IP Addressing) addresses. These addresses are from the block "169.254.x.x/25". Simple, when we say this type of IP address in a device, we can say that it has no IP address.

Laptop0

Physical Config **Desktop** Programming Attributes

**IP Configuration**

Interface Wireless0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 192.168.1.3

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

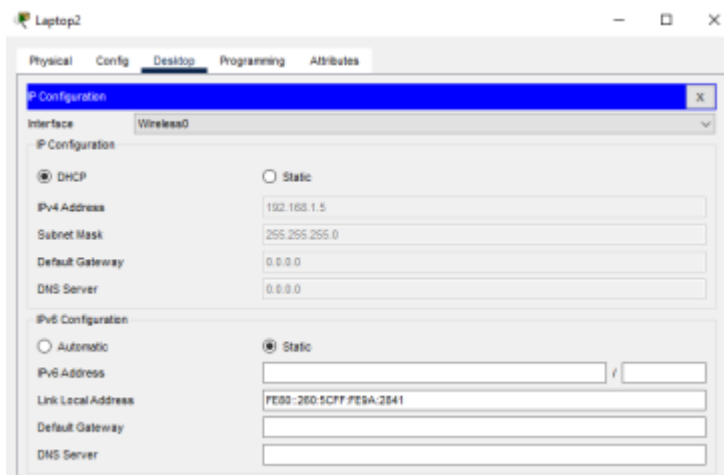
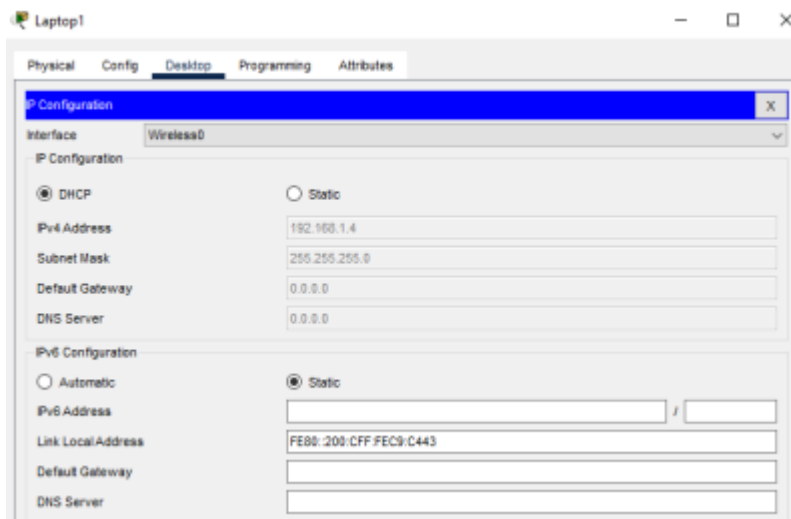
☐ Automatic ☒ Static

IPv6 Address

Link Local Address FE80::2E0:A3FF:FE83:3CA0

Default Gateway

DNS Server



Pinging laptop1 form laptop 2

Laptop0

Physical Config **Desktop** Programming Attributes

### Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>

C:\>ping 192.168.1.4

Pinging 192.168.1.4 with 32 bytes of data:

Reply from 192.168.1.4: bytes=32 time=63ms TTL=128
Reply from 192.168.1.4: bytes=32 time=39ms TTL=128
Reply from 192.168.1.4: bytes=32 time=33ms TTL=128
Reply from 192.168.1.4: bytes=32 time=38ms TTL=128

Ping statistics for 192.168.1.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 33ms, Maximum = 63ms, Average = 43ms

C:\>
```

Server0

Physical Config Services **Desktop** Programming Attributes

### IP Configuration

#### IP Configuration

☐ DHCP ☒ Static

IPv4 Address	192.168.1.1
Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0
DNS Server	0.0.0.0

#### IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address	
Link Local Address	FE80::203:E4FF:FE9B:187C
Default Gateway	

## TASK #02

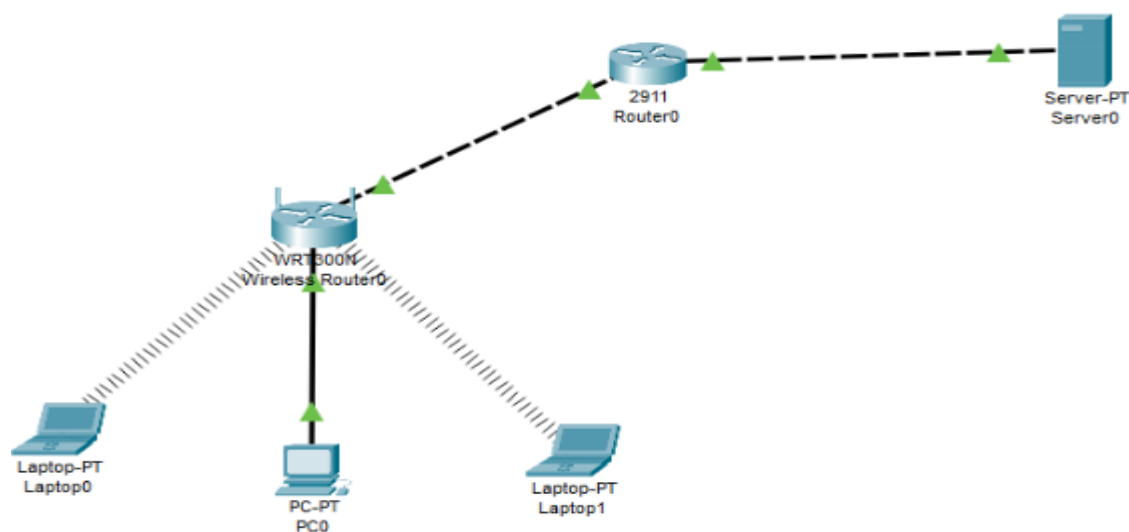
First get into Cisco Packet Tracer and in the physical mode, pick a wireless router and two laptops, a PC, a generic server and a 2800-series router (or just any other router other than wireless).

Connect the PC to the **Ethernet 1** of the wireless router.

For the laptops, replace the already-installed wired LAN module with a wireless adapter module (**WMP 300N**) .

Make sure that you first power off each laptop before you make any replacement then restore the power back after replacement. That's easy to do!

Once you have the wireless modules in place, you'll see the wireless connections come up between the laptops and the wireless router as shown below.



To do any configuration on the wireless router, we'll use its GUI (Graphical User Interface) which we can access either by:

Clicking the Wireless Router icon then **GUI tab**

Wireless Router0

Physical Config **GUI** Attributes

Wireless-N Broadband Router

**Setup** Setup Wireless Security Access Restrictions Applications & Gaming Admin  
Basic Setup DDNS MAC Address Clone

**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:  .  .  .

Subnet Mask:  ▾

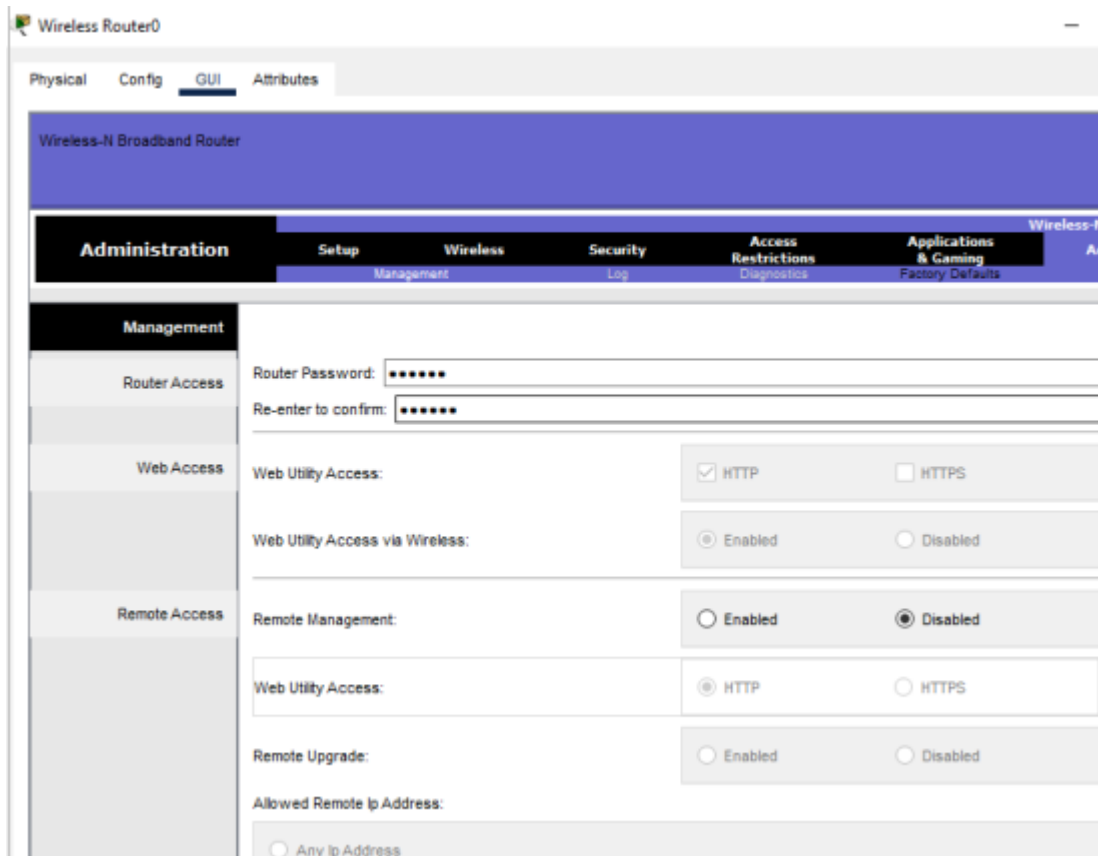
DHCP Server Settings

DHCP Server: ☒ Enabled ☐ Disabled

Start IP Address: 192.168.0.

Maximum number of Users:

Click on the **Administration** tab and set a new **password** for administrative access. Scroll down and **Save settings**. You will be prompted for a username and the new password you just set. A new screen appears confirming settings are successful. You can click on **continue** to continue with configurations.



Network setup means LAN setup. Already, we have a PC and three laptops in the LAN. We'll assign them IP addresses either statically or dynamically.

The default LAN network address given here is **192.168.0.0** with a subnet mask of 255.255.255.0. The first address in this network (192.168.0.1 by default) has been assigned to the LAN interface of the router. It has just been named **IP address**. Obviously, all the PCs in the LAN will use the LAN interface as their default interface.

Now, in the router's network settings, you may choose to enable DHCP to dynamically assign IP addresses to the PCs. On the other hand, if you choose to disable DHCP, then obviously, you'll have to configure static IP addresses on the PCs.

When you choose to enable DHCP, set the **start address** for the LAN pool, **maximum hosts** to be allowed in your LAN and the **DNS server** for the LAN. The PCs will receive addresses automatically from the pool.

- Ensure DHCP is checked.
- Leave the **IP address** as 192.168.0.1 (This is the default LAN gateway address).
- Set a start address of 192.168.0.50 and set **maximum users** to 100
- You can leave the DNS server entry as it is (0.0.0.0) or specify the address of a DNS server of your choice.



- Scroll down
- **Save settings.**

The screenshot shows the configuration interface for Wireless Router0. The 'Config' tab is selected, and the 'Network Setup' section is active. The 'Router IP' section shows an IP Address of 192.168.0.1 and a Subnet Mask of 255.255.255.0. The 'DHCP Server' is enabled, with a Start IP Address of 192.168.0.100, a Maximum number of Users of 50, and an IP Address Range of 192.168.0.100 - 149. The Client Lease Time is set to 0 minutes. Static DNS and WINS settings are also visible.

Enable DHCP on each PC for dynamic configuration. Go to the **IP configuration** tab for each PC and enable DHCP.

Each PC should automatically obtain an IP address from the router.

IP configuration for **Laptop1**:

The screenshot shows the configuration interface for Laptop0. The 'Desktop' tab is selected, and the 'IP Configuration' section is active. The 'Interface' is set to 'Wireless0'. Under 'IP Configuration', 'DHCP' is selected. The IPv4 Address is 192.168.0.101, Subnet Mask is 255.255.255.0, Default Gateway is 192.168.0.1, and DNS Server is 0.0.0.0. Under 'IPv6 Configuration', 'Static' is selected, and the Link Local Address is FE80::2E0:8FFF:FE5D:D5CA.

Now let's test our wireless LAN.

Ping PC2 from PC1. Ping succeed

```
Command Prompt

Cisco Packet Tracer PC Command Line 1.0
C:\>

C:\>ping 192.168.0.100

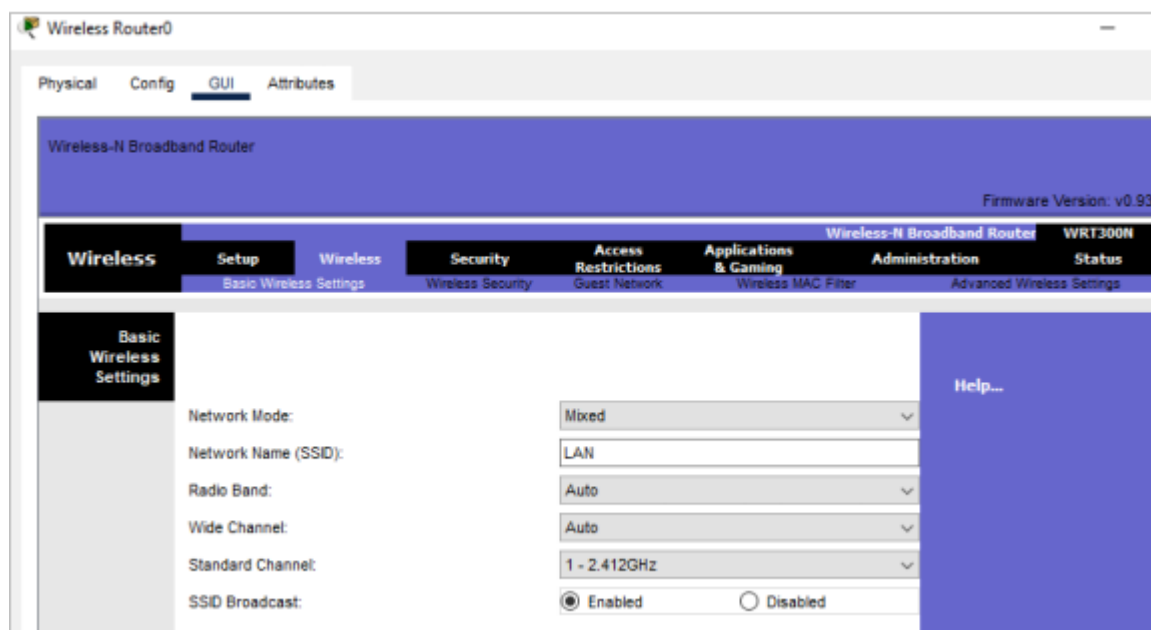
Pinging 192.168.0.100 with 32 bytes of data:

Reply from 192.168.0.100: bytes=32 time=32ms TTL=128
Reply from 192.168.0.100: bytes=32 time=32ms TTL=128
Reply from 192.168.0.100: bytes=32 time=27ms TTL=128
Reply from 192.168.0.100: bytes=32 time=33ms TTL=128

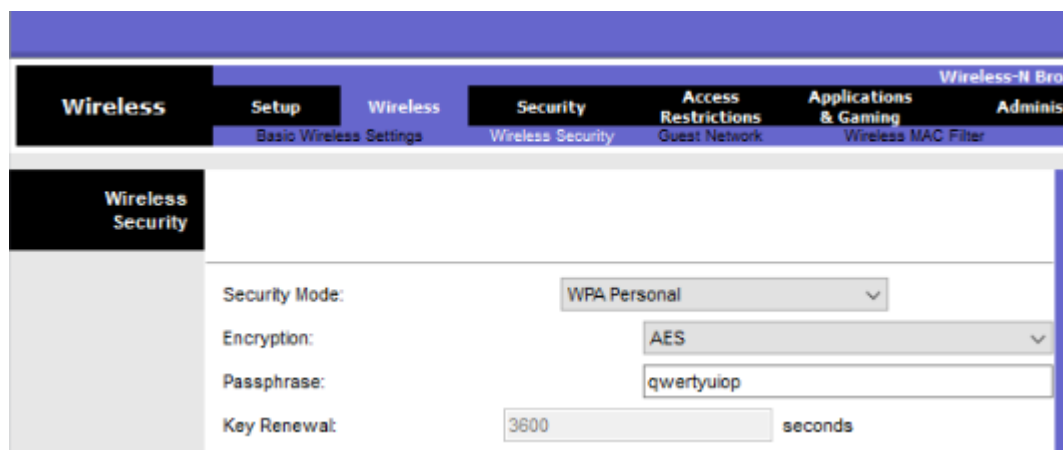
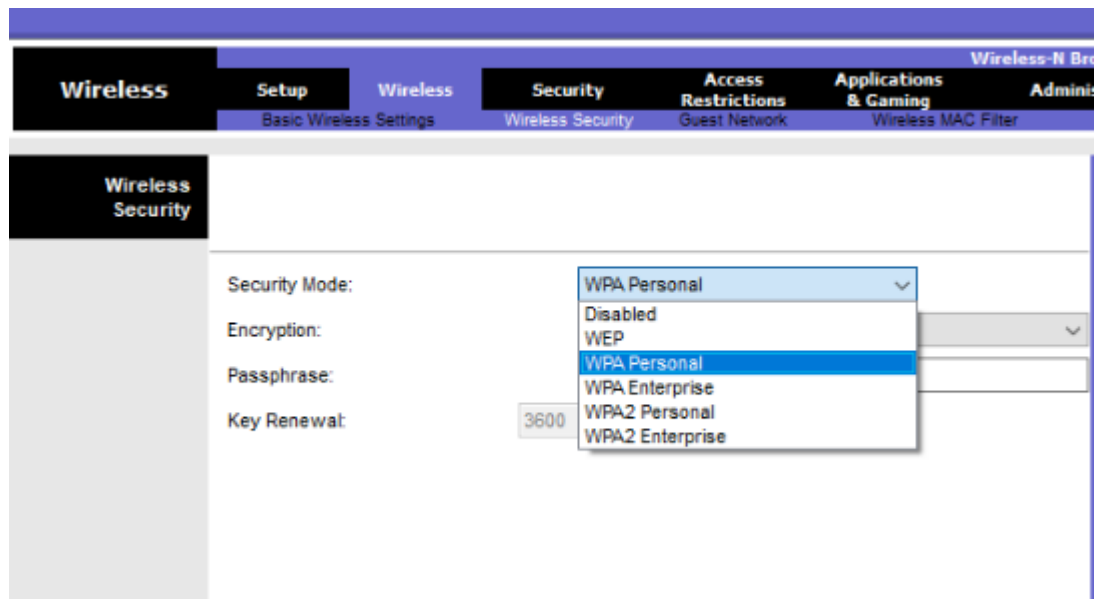
Ping statistics for 192.168.0.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 27ms, Maximum = 33ms, Average = 31ms
```

## Adding security for wireless LAN access

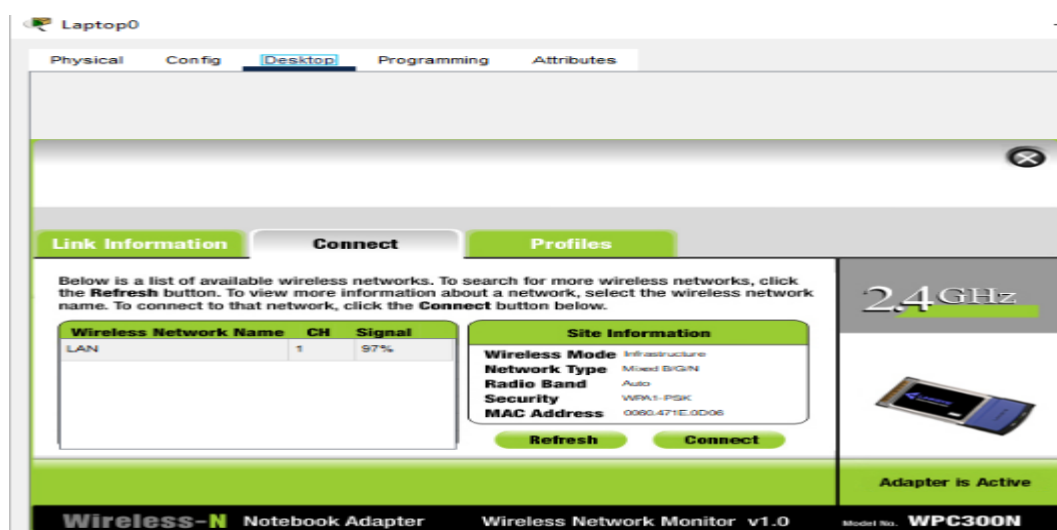
Access the GUI of wireless router then click on **Wireless** tab. Under the Basic Wireless Settings sub tab, change the default wireless **SSID** to any name of your choice.



in the **Wireless** tab, under the **Wireless security** sub tab, change security mode to **WPA personal** , then set **passphrase** field to a password of your choice. Scroll down and **Save settings**



The LAN network is now secured for wireless access. To test whether its really protected, click **Laptop1->Desktop->Wireless**.



### WPA-Personal Needed for Connection

This wireless network has WPA-Personal, also known as Pre-Shared Key, enabled. To connect to this network, select the encryption type. Enter the required Pre-Shared Key in the appropriate field below. Then click the **Connect**.

**Security**
WPA-Personal

Please select the wireless security method used by your existing wireless network.

**Encryption**
AES

Please select an encryption type used to protect your wireless data transmissions.

**Pre-shared Key**

Please enter a Pre-shared Key that is 8 to 63 characters in length.

| **Cancel** | **Connect**

Link Information

Connect


Below is a list of available wireless networks. To search the **Refresh** button. To view more information about a network, click the **More** button. To connect to that network, click the **Connect** button.

Wireless Network Name	CH	Signal
LAN	1	97%

Wireless Network  
Network  
Radio  
Security  
Management

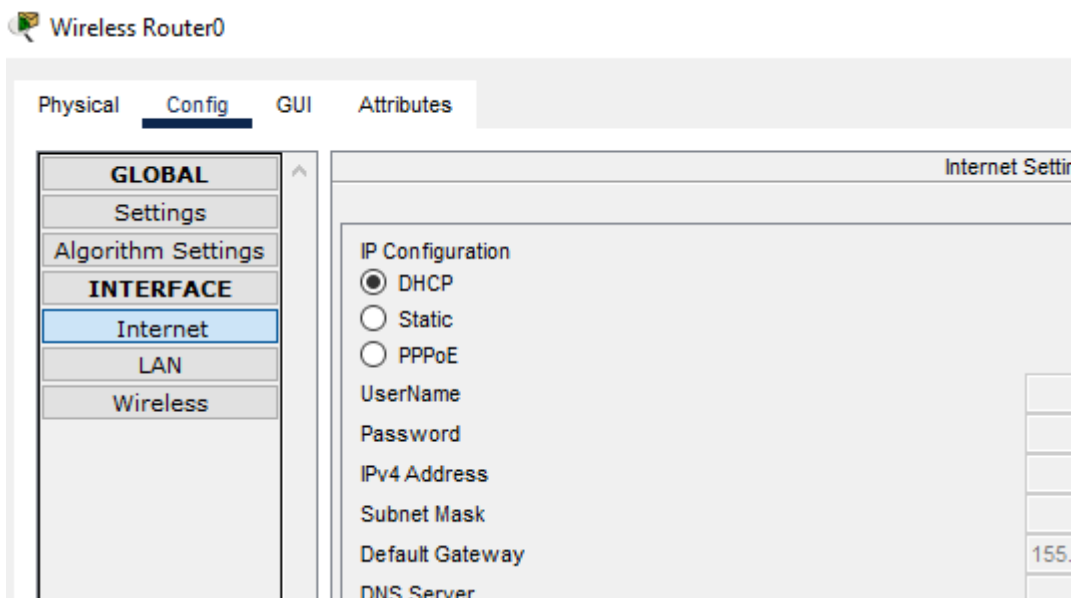
## Internet Setup

For now, we'll set the internet interface to act as a DHCP client (with the DHCP server configured on the ISP router) For now, we'll set the internet interface to act as a DHCP client (with the DHCP server configured on the ISP router)

 Router0  
Physical Config **CLI** Attributes  
IOS Command Line Interface  

```
Router(config-if)#  
Router(config-if)#exit  
Router(config)#interface GigabitEthernet0/0  
Router(config-if)#  
Router(config-if)#exit  
Router(config)#interface GigabitEthernet0/0  
Router(config-if)#ip add 155.21.21.1 255.255.0.0  
Router(config-if)#no shut  
  
Router(config-if)#  
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up  
  
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up  
  
Router(config-if)#exit  
Router(config)#dhcp pool mypool  
Router(config)#  
% Invalid input detected at '^' marker.  
  
Router(config)#ip dhcp pool mypool  
Router(dhcp-config)#net 155.21.0.0 255.255.0.0  
Router(dhcp-config)#default-router 155.21.21.1  
Router(dhcp-config)#dns-server 0.0.0.0  
Router(dhcp-config)#  
Router(dhcp-config)#  
Router(dhcp-config)#end  
Router#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#interface GigabitEthernet0/1  
Router(config-if)#  
%SYS-5-CONFIG_I: Configured from console by console
```

Now make the internet interface a DHCP client by enabling DHCP on it.



To verify DHCP configuration, click on the wireless router icon, then go to **Config** tab. Pick **DHCP**. The interface is now configured with an IP address from the pool set in the ISP router.

ServerU

Physical Config Services **Desktop** Programming Attributes

**IP Configuration**

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 155.21.0.2

Subnet Mask 255.255.0.0

Default Gateway 155.21.21.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address

Link Local Address FE80::210:11FF:FE9E:6151

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password

Ping the server from Laptop1. Ping succeed

```
C:\>ping 155.21.0.2

Pinging 155.21.0.2 with 32 bytes of data:

Reply from 192.168.0.1: Destination host unreachable.
Reply from 192.168.0.1: Destination host unreachable.
Reply from 192.168.0.1: Destination host unreachable.
Reply from 192.168.0.1: Destination host unreachable.

Ping statistics for 155.21.0.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Command Prompt

```
Pinging 192.168.0.100 with 32 bytes of data:

Reply from 192.168.0.100: bytes=32 time=32ms TTL=128
Reply from 192.168.0.100: bytes=32 time=32ms TTL=128
Reply from 192.168.0.100: bytes=32 time=27ms TTL=128
Reply from 192.168.0.100: bytes=32 time=33ms TTL=128

Ping statistics for 192.168.0.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 27ms, Maximum = 33ms, Average = 31ms

C:\>ping 169.254.97.81

Pinging 169.254.97.81 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 169.254.97.81:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```