

**Practical on Elective-2: Computer Networking (Wireless Networking)**

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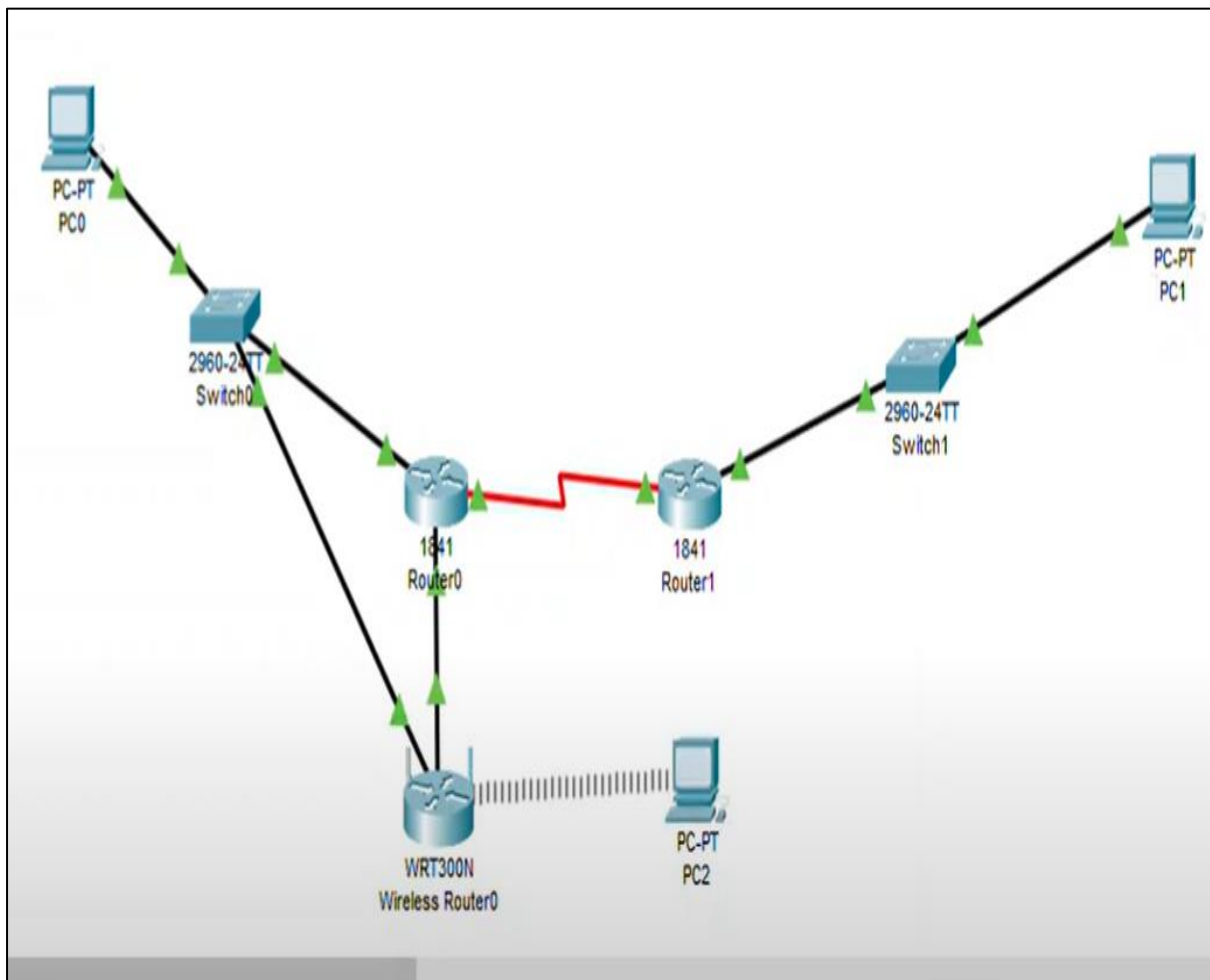
## **PRACTICAL NO. 1**

**Aim:-** Configuring WEP on a Wireless Router.

### **Theory:-**

WEP (Wired Equivalent Privacy) is an outdated and insecure wireless security protocol is highly vulnerable to security breaches, and it is strongly recommended to use more secure protocols like WPA2 or WPA3 if your devices support them.

### **Diagram:-**



## **Steps:-**

### **Step1:**

- 1) Take 2 machines and name them as PC-A and PC-B.
- 2) Take 2 switches of 2960 and give names S1 and S2.
- 3) Take 2 router of 1841 and name them as R1 and R2.

### **Step 2:**

- 1) Now Connect PC-A to switch S1 with fast Ethernet 0 to Fast Ethernet 0/1.
- 2) Connect switch S1 to Router R1 with Fast Ethernet 0/1 to Fast Ethernet 0.
- 3) Now Connect PC-B to Switch 2, with Fast Ethernet 0 to Fast Ethernet 0/1.
- 4) Connect switch S2 to Router R2 with Fast Ethernet 0/0 to Fast Ethernet 0.
- 5) Now connect 2 Routers serially with serial cable 0/0/0 to serial 0/0/0.

### **Step 3:**

- 1) Now click on device PC-A go to desktop click on IP Configure and add IP Address and submit mask to it.
- 2) Same goes for PC-B.
- 3) Now click on router R1 go to configure then go to fast Ethernet 0/0 and IP Address and submit mask to it and make it ON.
- 4) Same goes for R2.
- 5) Then click on R1 go to configure then go to the serial 0/0/0 and add IP Address and subnet mask to it and make it ON.
- 6) Same goes for R2.
- 7) Click R1 go to configure and set the RIP.
- 8) Same goes for R2.
- 9) Then check the connectivity.

### **Step4:**

- 1) Take 1 wireless router of WRT300N Name as Router A.
- 2) Then connect the router A to switch S1, with Fast Ethernet 0/3 to Ethernet 1.
- 3) Then connect the router R1 to router A with Fast Ethernet 0/1 to Ethernet 1.

**Step 5:**

- 1) Click on R1 go to the configure then go to Fast Ethernet 0/1 and add IP Address and subnet mask to it and make it ON.
- 2) Then click Router A go to the GUI then go to setup and change the IP Address.
- 3) Click router A go to the GUI then go to wireless and set the wireless security and save setting.

**Step 6:**

- 1) Take 1 machine and give name PC-C.
- 2) Click on PC-C go to the physical then Replace wire and make it on, then go to the configure go to wireless 0 Select WEP then give password.
- 3) Then check the connectivity.

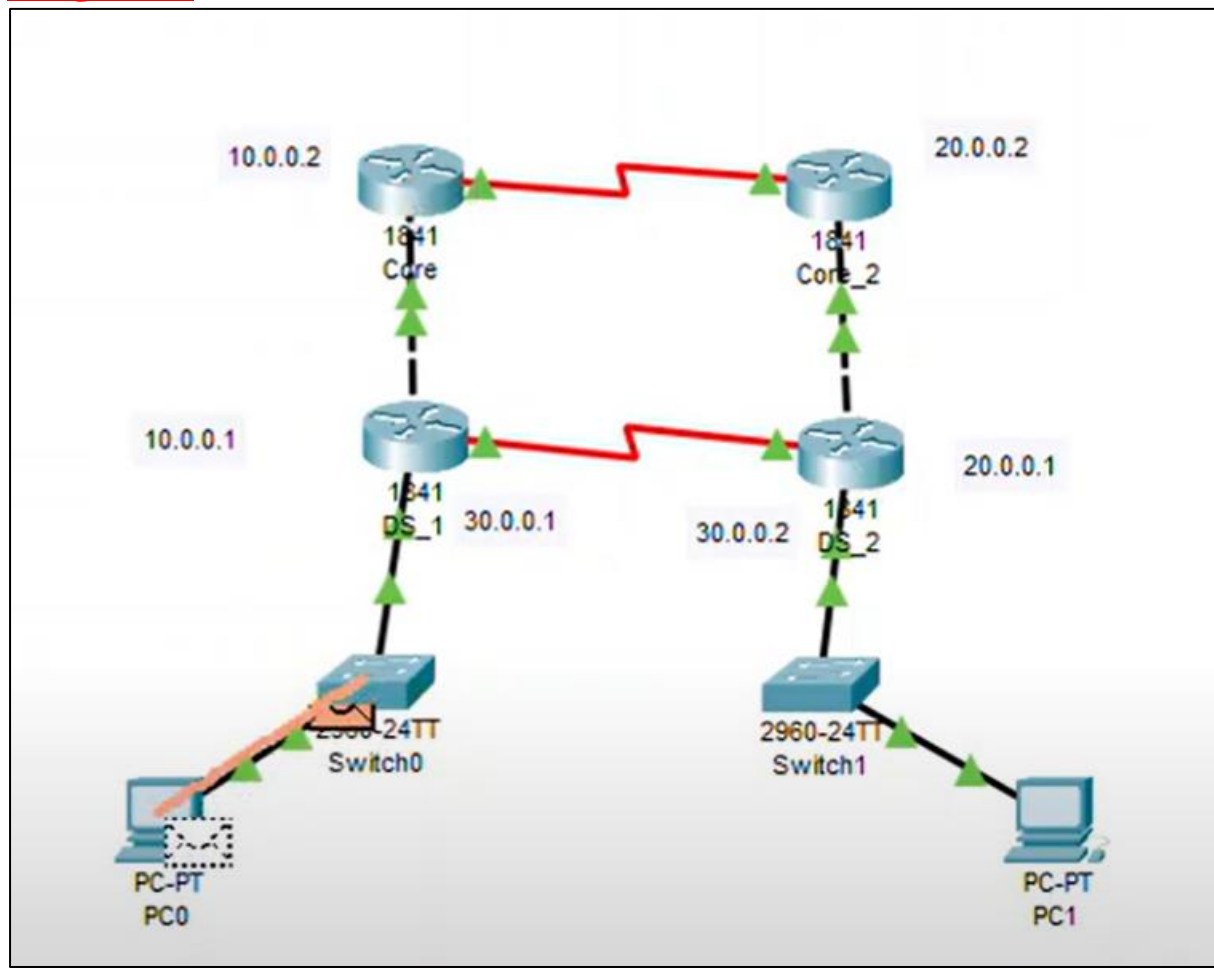
## PRACTICAL NO. 2

**Aim:-** Demonstrating Distribution Layer Functions.

### **Theory:-**

The distribution layer in a network is responsible for providing policy-based connectivity and controlling the flow of traffic between different network segments. It plays a crucial role in ensuring efficient and secure communication within a network.

### **Diagram:-**



## **Steps:-**

### **Step1:**

- 1) Take 4 routers of 1841 and name them as R0, R1, R2 & R3.
- 2) Take 2 machines and give name PC-A and PC-B.
- 3) Take 2 Switches and give name S1 and S2.

### **Step 2:**

- 1) Connect PC-A to switch S1 with Fast Ethernet to Fast Ethernet 0/1.
- 2) connect PC-B to Switch S2 with Fast Ethernet 0 to Fast Ethernet 0/1.
- 3) Connect switch S1 to Router R0 with Fast Ethernet 0/2 to Fast Ethernet 0/0.
- 4) Connect Switch S2 to Router R3 with Fast Ethernet 0/2 to Fast Ethernet 0/0.
- 5) Connect Router R0 to R1 with Fast Ethernet 0/1 to Fast Ethernet 0/0.
- 6) Connect Router R3 to R2 with Fast Ethernet 0/1 to Fast Ethernet 0/0.
- 7) Connect Router R0 to R3 with serial cable (serial 0/0/0).
- 8) Connect Router R1 to R2 with serial cable (Serial 0/0/0).

### **Step 3:**

- 1) Now, click on PC-A go to desktop click on IP configure and add IP Address and Subnet mask to it.
- 2) Same goes for PC-B.
- 3) Click on Router R0 go to configure then go to Fast Ethernet 0/0 and Add IP Address and subnet mask to it and make it ON.
- 4) Same goes for R3.
- 5) Click on Router R0 go to configure then go to Fast Ethernet 0/1 and add IP Address and subnet mask to it and make it ON.
- 6) Click on Router R1 go to configure then go to Fast Ethernet 0/0 and add IP Address and subnet mask to it and make it ON.
- 7) Click on Router R3 go to configure then go to Fast Ethernet 0/1 and add IP Address and subnet mask to it and make it ON.
- 8) Click on Router R3 go to configure then go to Fast Ethernet 0/0 and add IP Address and subnet mask to it and make it ON.

9) Click on R0 go to the configure then go to serial 0/0/0 and add IP Address and subnet mask to it and make it ON.

10) Same goes for R3, R1, R2.

11) Click on R0 go to configure and set the RIP.

12) Same goes for R1, R2 R3.

#### **STEP 4:**

1) Reset the simulation.

Then go to edit filter and select only RIP

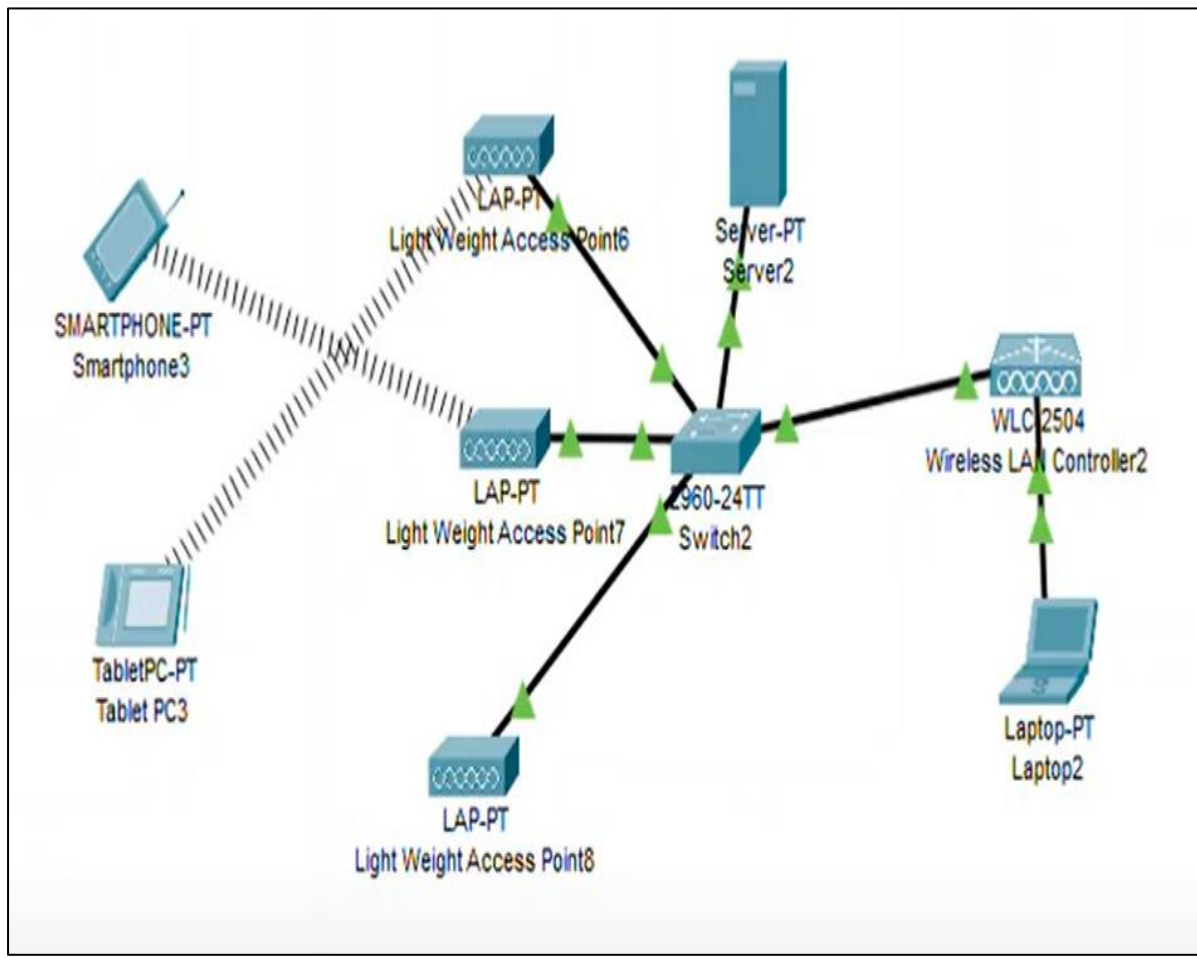
## **PRACTICAL NO. 3**

**Aim:-** Demonstrating Placing ACLs.

### **Theory:-**

Access Control Lists (ACLs) are used to control traffic by defining rules that permit or deny packets based on criteria such as source/destination IP addresses, protocols, and port numbers. Placing ACLs at different points in a network allows administrators to control traffic flow and enhance security.

### **Diagram:-**



### **Steps:-**

**Step 1:** Verify network connectivity.

- 1) Verify that all of the PCs can communicate with each other and with the servers.



- 2) Verify that the internet host can access the web server (192.168.0.3), sales server (192.168.10.2) and HR server (192.168.40.2) using browser.

**Step 2:** Examine the access control list that are configured on the Routers.

- 1) Access the distribution 1 router use the following command to view the ACL that has been configured on the distribution 1 Router.
  - Show running configure.
  - Show access-list 1.
- 2) Access the gateway router uses the following command to view the ACL that has been configured on the gateway router.
  - Show running-configure.
  - Show access-lists 100.

**Step 3:** Determine the appropriate interface to apply ACLs.

- 1) After examining the ACLs determine on which interface the ACLs should be applied.
- 2) The ACL must be applied to an interface or sub interface before it will be after the network traffic.
- 3) The extended ACL should be placed closest to the source and standard ACL should be closest to the destination.
- 4) Remember that only one ACL per port, per protocol per direction is allowed.
- 5) Apply the ACL to Appropriate interface or sub interface.

**Step 4:** Examine the effects of the ACLs.

- 1) Internet Host should be able to ping any device in the network, except HR1 or HR server.
- 2) Internet Host should be able to access web server (192.168.0.3) using the browser.
- 3) Internet Host should not be able to access either the HR server (192.168.40.1) or sales server (192.168.10.2) using the browser.
- 4) HR2 should be able to access HR server (192.168.40.1) using ping or the browser.
- 5) Router R and D2 should be not able to access HR server (192.168.40.1) using ping or browser.

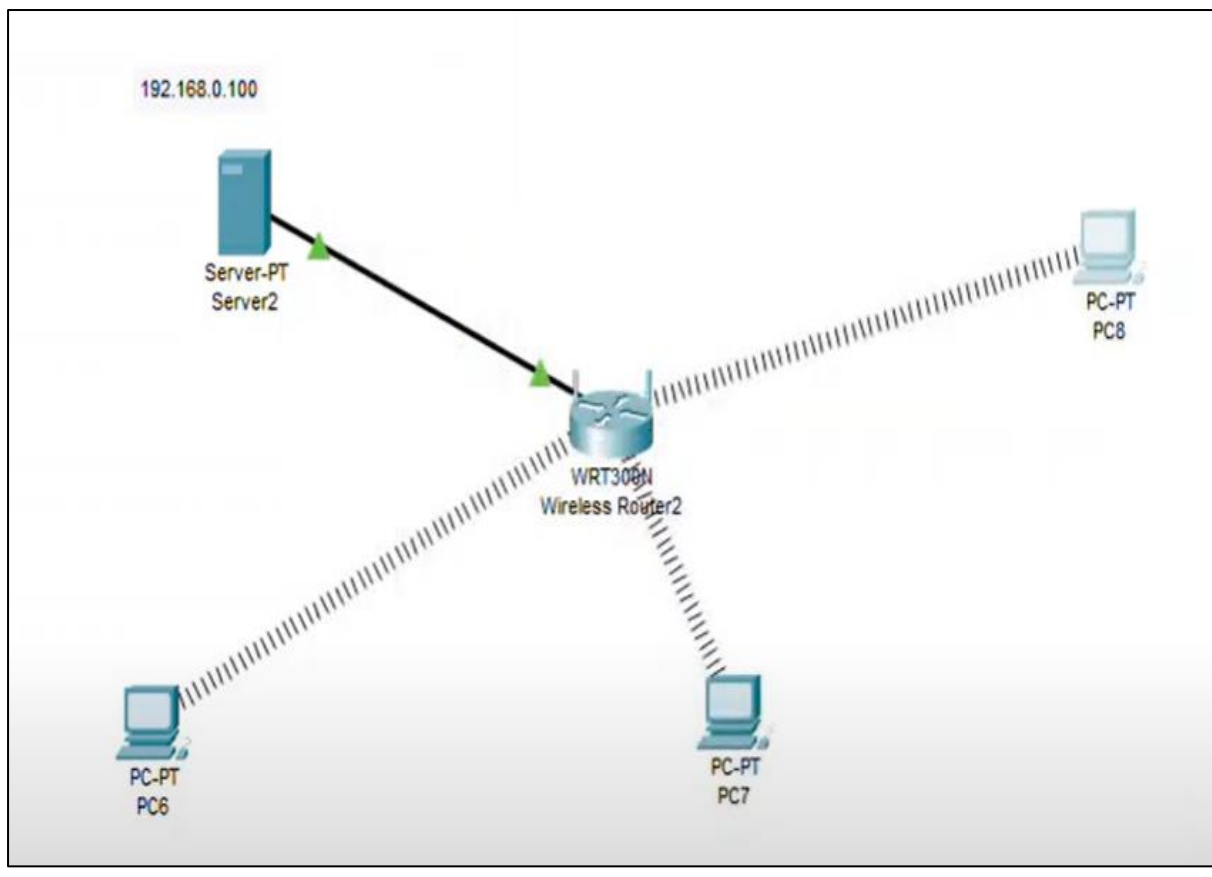
## **PRACTICAL NO. 4**

**Aim:-** Demonstrating Planning Network-based Firewalls.

### **Theory:-**

Planning network-based firewalls involves designing a security strategy that includes the placement, configuration, and rules for firewalls within a network.

### **Diagram:-**



### **Steps:-**

#### **Step1:**

- 1) Take 1 server and name as S1.
- 2) Take 3 machine and name them as PC-A, PC-B, PC-C.
- 3) Take one wireless router of WRT300N name as Router A.

### **Step 2:**

- 1) Connect server S1 to Router A with Fast Ethernet 0 to Ethernet 1.
- 2) Click on server S1 then go to desktop click on IP configure and click on DHCP.
- 3) Click on PC-A go to the physical then replace wire and make it ON.
- 4) Same goes for PC-B and PC-C.

### **Step 3**

- 1) Click on server S1 go to the desktop, then go to the IPV4 Firewall and make it ON, then add remote IP.
- 2) Click ON PC-B go to the desktop, click on Web browser and check the IP protocol is ON or OFF.
- 3) Same goes for PC-A, PC-C.

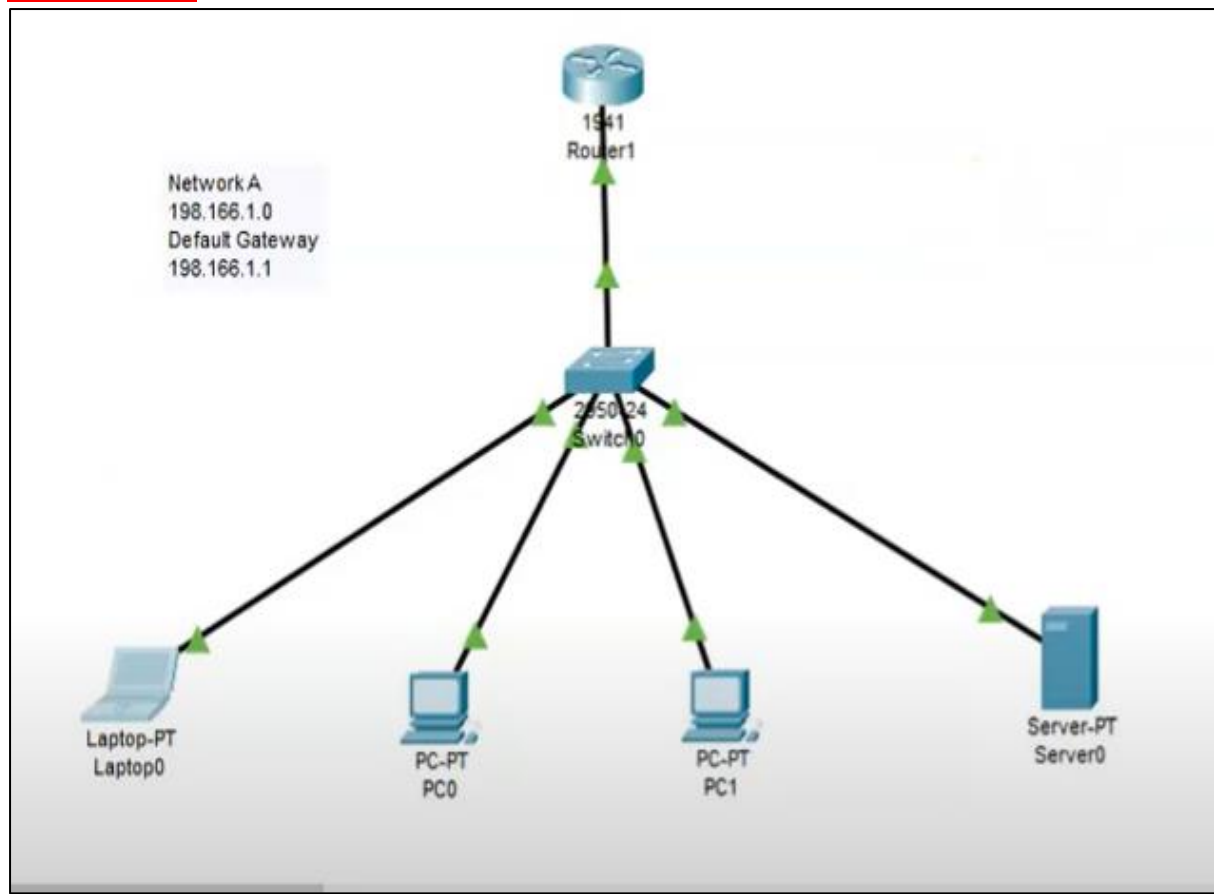
## **PRACTICAL NO. 5**

**Aim:-** Configure Auto Profiles ACU Utilities.

### **Theory:-**

Auto Configuration and Utilities (ACU) and general principles related to configuring network profiles. If you have a specific technology or product in mind, please provide additional details so I can offer more targeted assistance.

### **Diagram:-**



### **Steps:-**

#### **Step1:**

- 1) Take 1 server and name as S1.
- 2) Take 3 machine and name them as PC-A, PC-B, PC-C.
- 3) Take one wireless router of WRT300N name as Router A.

**Step 2:**

- 1) Connect server S1 to Router A with Fast Ethernet 0 to Ethernet 1.
- 2) Click on server S1 then go to desktop click on IP configure and click on DHCP.
- 3) Click on PC-A go to the physical then replace wire and make it ON.
- 4) Same goes for PC-B and PC-C.

**Step 3**

- 1) Click on server S1 go to the desktop, then go to the IPV4 Firewall and make it ON, then add remote IP.
- 2) Click ON PC-B go to the desktop, click on Web browser and check the IP protocol is ON or OFF.
- 3) Same goes for PC-A, PC-C.

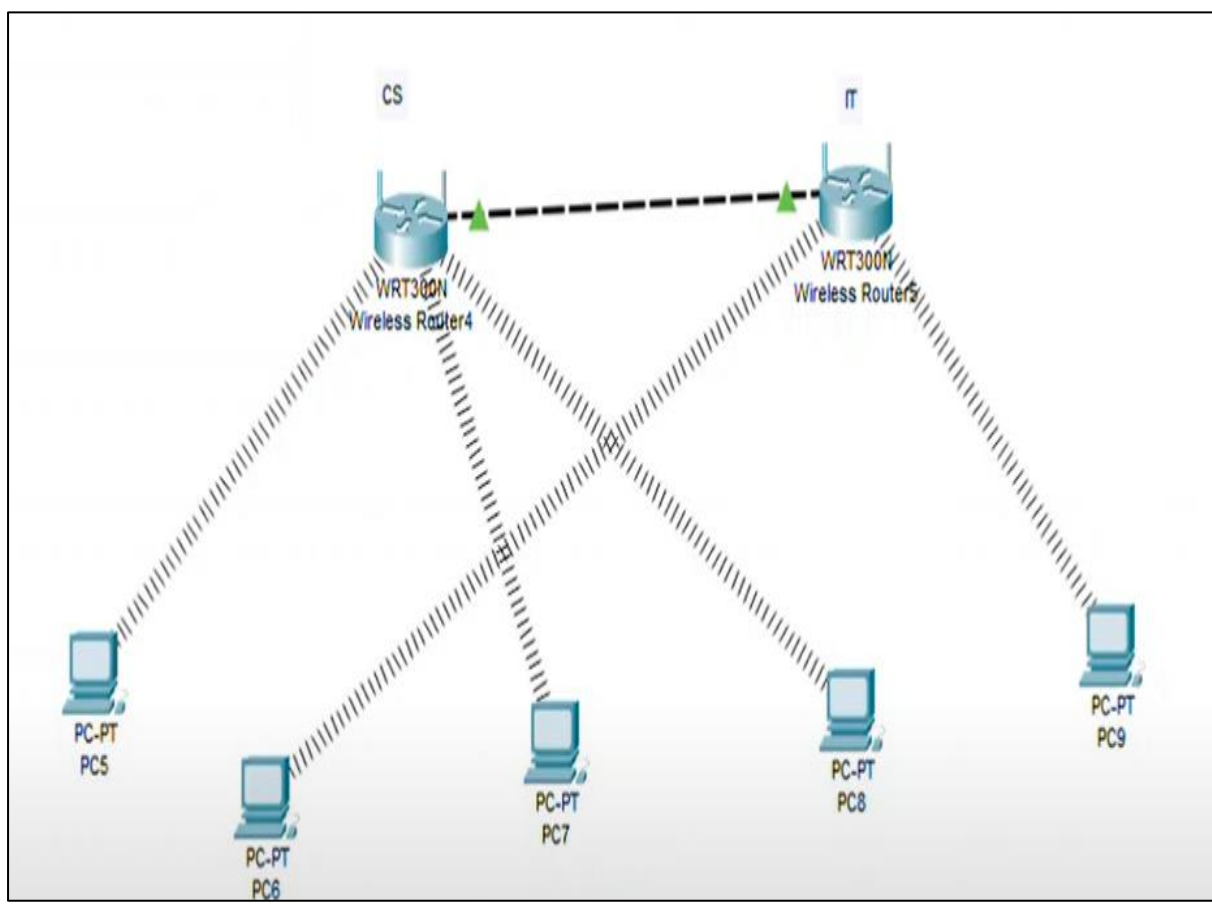
## PRACTICAL NO. 6

**Aim:-** Creating an Adhoc Network.

### **Theory:-**

Creating an ad-hoc network, also known as a peer-to-peer network, allows devices to connect directly to each other without the need for a central wireless access point.

### **Diagram:-**



### **Steps:-**

#### **Step 1:**

- 1) Take 5 Machine and give name PC-1 to it.
- 2) Take 2 Routers of 1841 and name them R1 and R2.

### **Step 2:**

- 1) Connect PC-1 to switch R1 with Fast Ethernet 0 to Fast Ethernet 0/1 cable.
- 2) Then Connect switch R2 to Router R1 with Fast Ethernet 0/2 to Fast Ethernet 0/0 cable.
- 3) Then Connect switch PC- B to Router R2 with Fast Ethernet 0/3 to Fast Ethernet 0/0 cable.

**(Wait for few seconds it will turn into green light.)**

### **Step 3:**

- 1) Now click on device PC-1 go to desktop click on IP Config and add IP Address and Subnet mask to it.
- 2) click on R1 go to Config and select the Fast Ethernet 0/0, after that add the IP Address and Subnet Mask to it and turn it ON.
- 3) Same Goes for router R2.

### **Step 4:**

- 1) After configuring the connection between the router and switches, take a packet and try to make it flow.
- 2) Then click on R1 and go to the CLI Commands and configure the router R1.

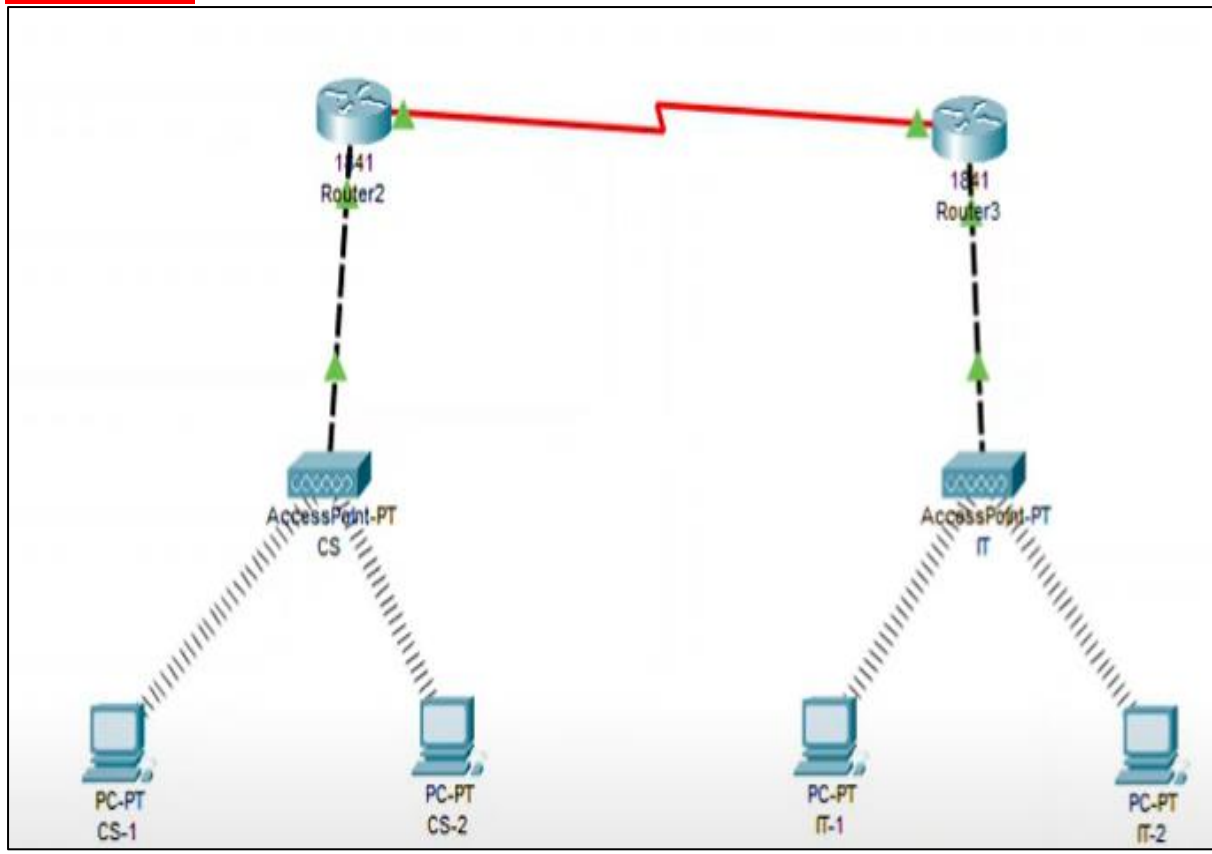
## **PRACTICAL NO. 7**

**Aim:-** Configuring Basic AP Settings.

### **Theory:-**

Configuring basic Access Point (AP) settings involves setting up the essential parameters to enable wireless communication in a network.

### **Diagram:-**



### **Steps:-**

#### **Step 1:** (Requirement)

- 1) Take 2 Switches of 2960 and name it as S1, S2.
- 2) Take 2 Router of 1841 and name them as R1 and R2.
- 3) Take 4 Machines and name them PC-A, PC-B, PC-C, PC-D.

#### **Step 2:** Configure the basic Switch setting.

- 1) Now connect switch R1 to R2 with Giga Ethernet 0/1 to Giga Ethernet 0/1 cable.
- 2) Once again Connect switch R1 to S1 with Giga Ethernet 0/2 to Giga Ethernet 0/2 cable.



- 3) Then Connect R2 to S2 with Fast Ethernet 0/21 to Fast Ethernet 0/21 cable.
- 4) Then Connect S1 to PC-A and PC-B with Fast Ethernet 0/23 to Fast Ethernet 0/23 cable.
- 5) Once again Connect S2 to PC-C and PC-D with Fast Ethernet 0/24 to Fast Ethernet 0/24 cable.

**Step 3:**

- 1) Click on S1 and go to CLI command and Configure the Switch S1.  
Similarly Configure the Switch S2.

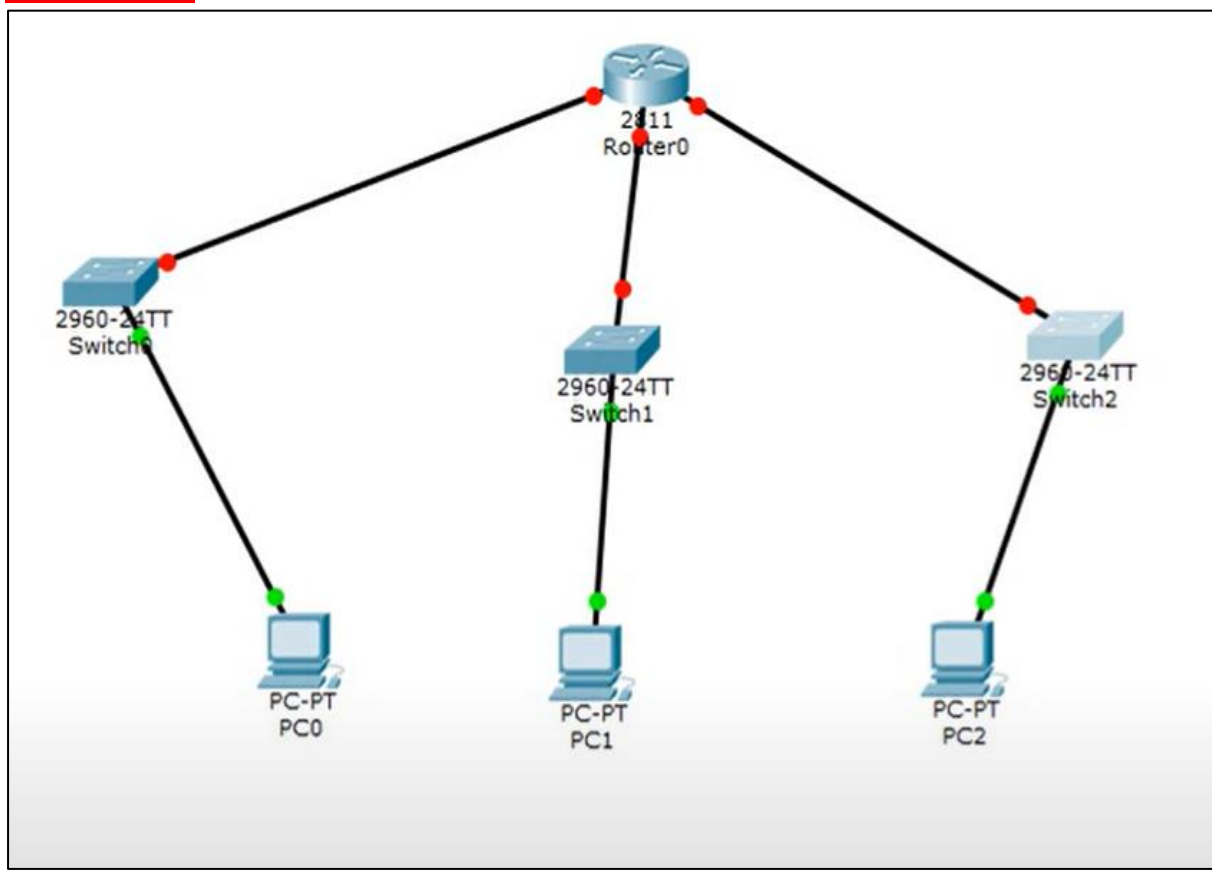
## **PRACTICAL NO. 8**

**Aim:-** Configure Ethernet/Fast Ethernet Interface.

### **Theory:-**

Configuring an Ethernet or Fast Ethernet interface on a router or switch involves setting up basic parameters for the interface to enable communication within a network.

### **Diagram:-**



### **Steps:-**

#### **Step 1:** (Requirement)

- 1) Take 2 Switches of 2960 and name it as S1, S2.
- 2) Take 2 Router of 1841 and name them as R1 and R2.
- 3) Take 4 Machines and name them PC-A, PC-B, PC-C, PC-D.

**Step 2:** Configure the basic Switch setting.

- 1) Now connect switch R1 to R2 with Giga Ethernet 0/1 to Giga Ethernet 0/1 cable.
- 2) Once again Connect switch R1 to S1 with Giga Ethernet 0/2 to Giga Ethernet 0/2 cable.
- 3) Then Connect R2 to S2 with Fast Ethernet 0/21 to Fast Ethernet 0/21 cable.
- 4) Then Connect S1 to PC-A and PC-B with Fast Ethernet 0/23 to Fast Ethernet 0/23 cable.
- 5) Once again Connect S2 to PC-C and PC-D with Fast Ethernet 0/24 to Fast Ethernet 0/24 cable.

**Step 3:**

- 1) Click on S1 and go to CLI command and Configure the Switch S1. Similarly Configure the Switch S2.

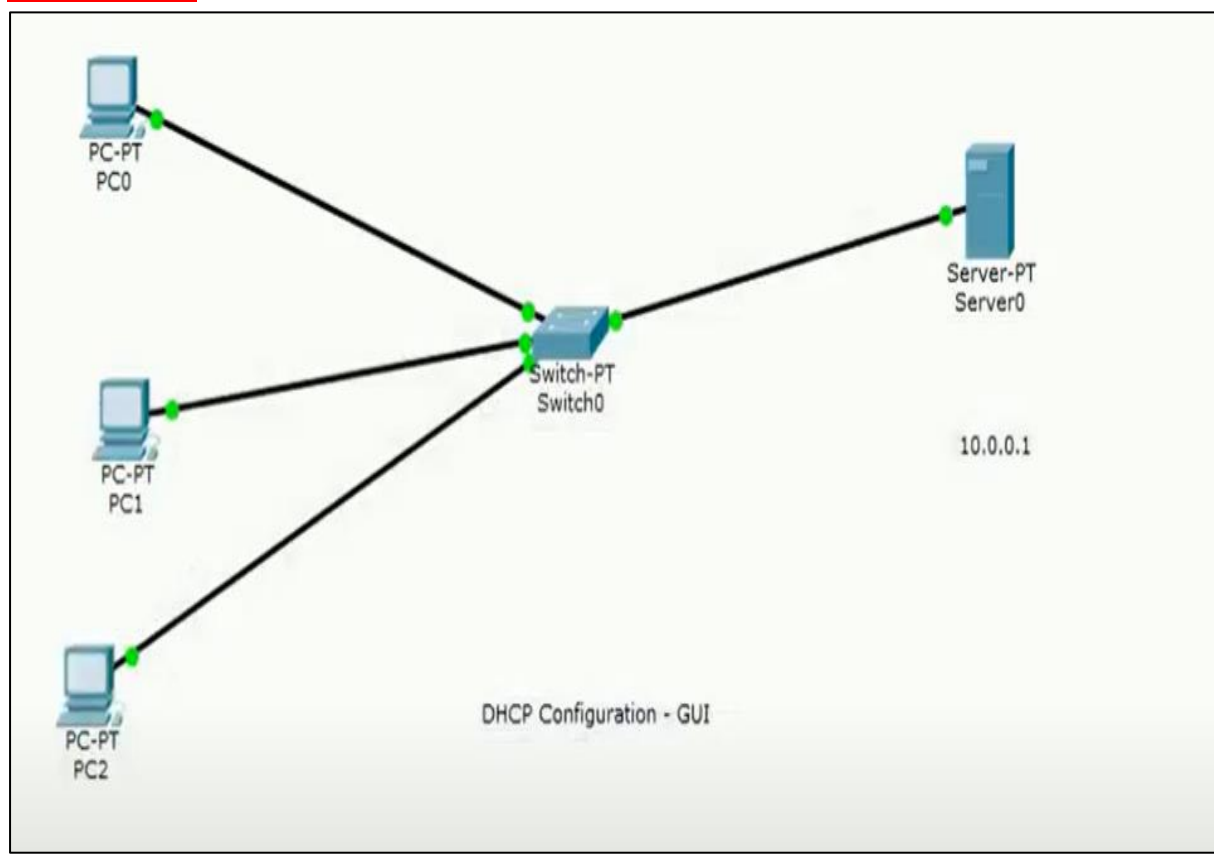
## **PRACTICAL NO. 9**

**Aim:-** Configure Radio Interfaces through the GUI.

### **Theory:-**

The specific steps for configuring radio interfaces through a graphical user interface (GUI) can vary depending on the device and the manufacturer's software. However, I can provide you with a general guide using an example scenario with a wireless router. Please note that the actual steps may differ based on the router or wireless access point model.

### **Diagram:-**



### **Steps:-**

#### **Step 1:** (Requirement)

- 1) Take 2 Switches of 2960 and name it as S1.
- 2) Take 3 Machines and name them PC-A, PC-B, PC-C.
- 3) Take 1 Server PT and name it Server 0.

**Step 2:** Configure the basic Switch setting.

- 1) Once again Connect switch S1 to Server 0 with Giga Ethernet 0/2 to Giga Ethernet 0/2 cable.
- 2) Then Connect S1 to PC-A and PC-B with Fast Ethernet 0/23 to Fast Ethernet 0/23 cable.
- 3) Once again Connect S1 to PC-C with Fast Ethernet 0/24 to Fast Ethernet 0/24 cable.

**Step 3:**

- 1) Click on S1 and go to CLI command and Configure the Switch S1.

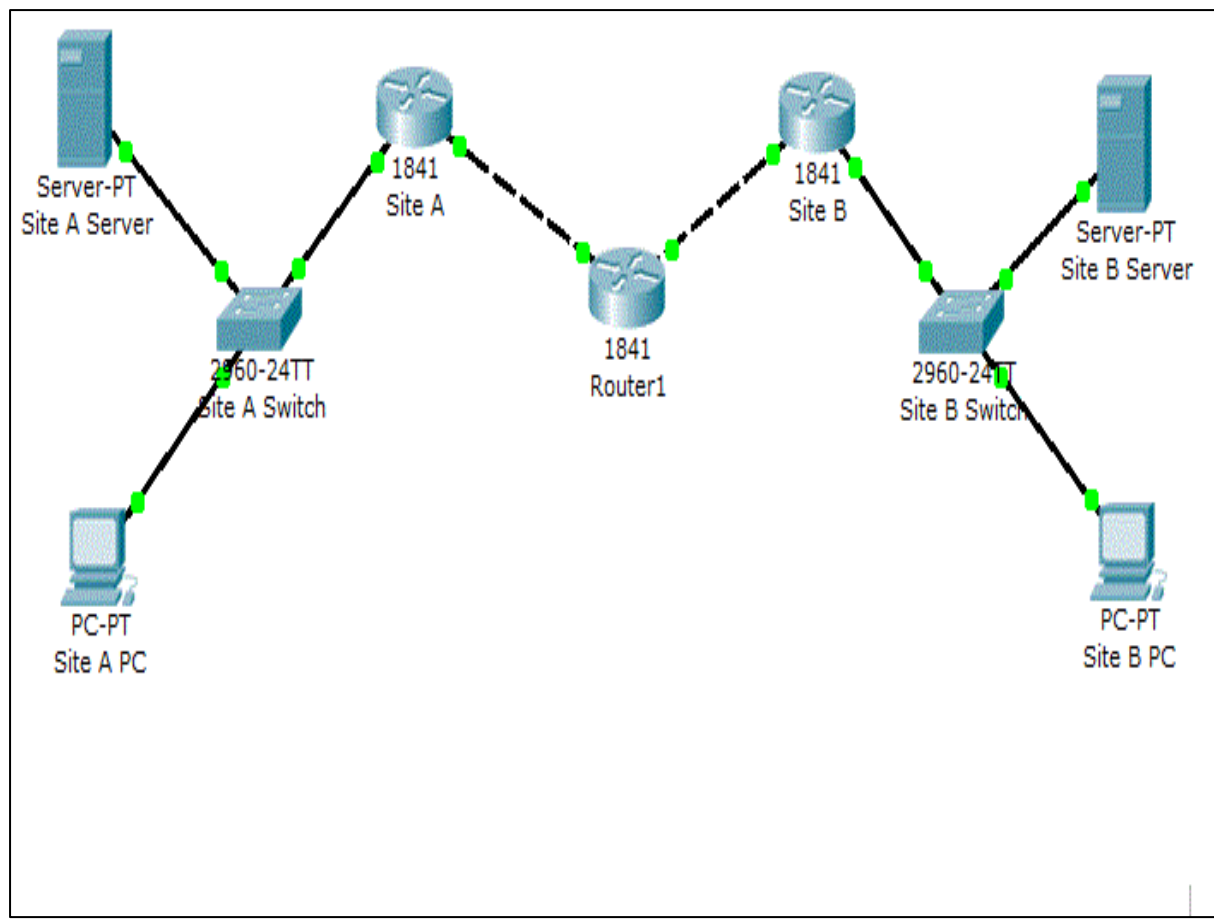
## **PRACTICAL NO. 10**

**Aim:-** Configure Site-to-Site Wireless Link.

### **Theory:-**

Configuring a site-to-site wireless link involves connecting two separate locations using wireless technology. This is typically done using point-to-point wireless bridges.

### **Diagram:-**



### **Steps:-**

#### **Step 1:** (Requirement)

- 1) Take 2 Switches of 2960 and name it as S1.
- 2) Take 3 Machines and name them PC-A, PC-B, PC-C.
- 3) Take 1 Server PT and name it Server 0.

**Step 2:** Configure the basic Switch setting.

- 1) Once again Connect switch S1 to Server 0 with Giga Ethernet 0/2 to Giga Ethernet 0/2 cable.
- 2) Then Connect S1 to PC-A and PC-B with Fast Ethernet 0/23 to Fast Ethernet 0/23 cable.
- 3) Once again Connect S1 to PC-C with Fast Ethernet 0/24 to Fast Ethernet 0/24 cable.

**Step 3:**

- 1) Click on S1 and go to CLI command and Configure the Switch S1.