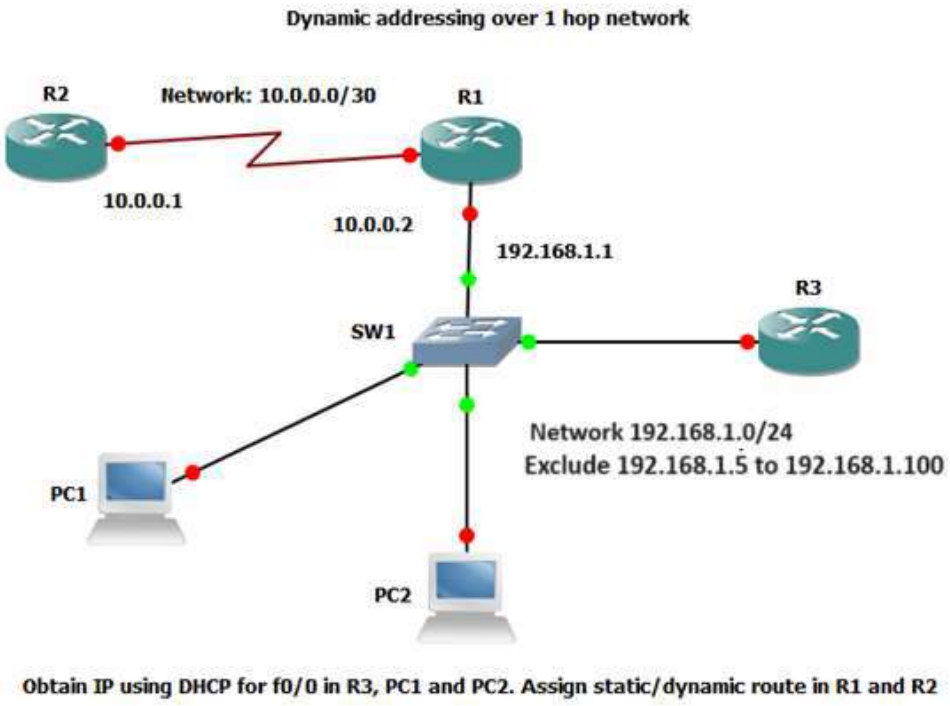
Chapter 8

Lab 7: Design a 1-hop network to demonstrate dynamic addressing using GNS3 and Wireshark

8.1 Objective

Design a simple 1-hop network to demonstrate dynamic addressing and dynamic routing using GNS3. Configure a DHCP server in R1 with address pool 192.168.1.0 /24 and configure R3 as a DHCP client. Assign addresses using DHCP to the interfaces in PC1, PC2 and R3.



8.2 Procedure

1. Configure the router interfaces of R1 and R2 as shown in the Section 1.2.4.
2. For dynamic routing configure as shown in Section 8.2.
3. For configuring DHCP server in PC1:

```
R1(config)# ip dhcp pool POOL_A
R1(dhcp-config)# ip dhcp excluded-address 192.168.1.5 192.168.1.100
R1(config)# ip dhcp pool POOL_A
R1(dhcp-config)# dns-server 192.168.1.1
R1(dhcp-config)# default-router 192.168.1.1
R1(dhcp-config)# lease 3
R1(dhcp-config)# network 192.168.1.0 /24
```

```
R1(dhcp-config)# import all
```

4. To configure R3 as a DHCP client and obtain IP address for f0/0

```
R3(config)# interface f0/0
R3(config-if)#ip dhcp client client-id ascii My_name
R3(config-if)#ip address dhcp
```

5. For PC assign IP address using DHCP
   PC1> ip dhcp -d

8.3 Analyses

1. Show the IP addresses assigned via DHCP in the router R1's terminal window
2. Show the routing tables in R1 and R2 in the router terminal windows
3. Show DHCP server statistics in the router R1's terminal window
4. Show DHCP server's pool information in the router R1's terminal window
5. Run Wireshark on PC1 and analyze the packets exchanged between PC1 and the DHCP server when obtaining IP address. Write port numbers, IP address and MAC address for each packet observed.
6. Run Wireshark on PC1 to show the packets exchange when PC2 is pinged from PC1. Show packet capture and write port numbers, IP addresses of each Echo request and reply. Explain ping statistics.