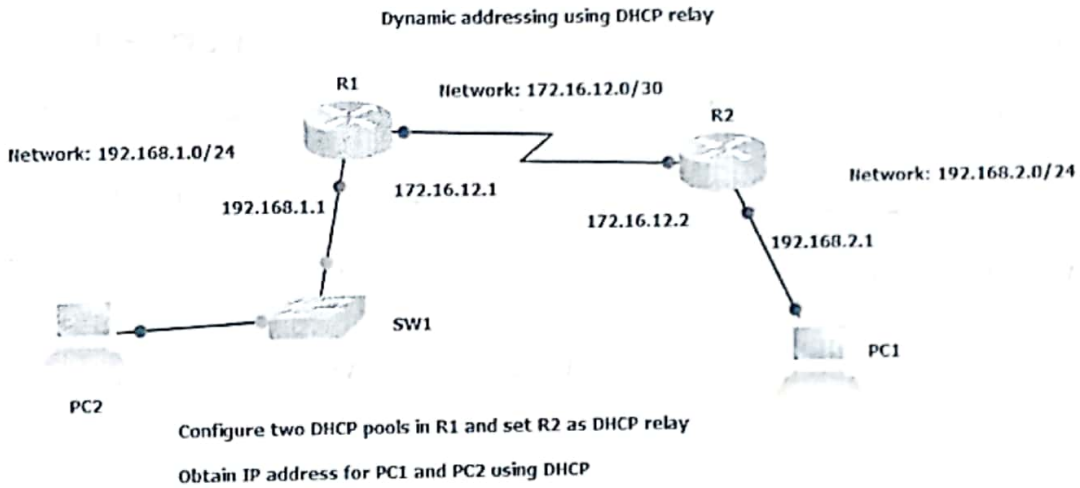
Odd 2024

Chapter 9

Lab 8: Design a 2-hop network to demonstrate dynamic addressing using GNS3 and Wireshark

9.1 Objective

Design a 2-hop network to demonstrate dynamic addressing and dynamic routing using GNS3. Configure a DHCP server in R1 with two pools 192.168.1.0 /24 and 192.168.2.0 /24. Exclude the addresses 192.168.1.1–192.168.1.50 and 192.168.2.1–192.168.2.100 from the address pools. Configure R2 as a DHCP relay. Assign addresses using DHCP to the interfaces in PC1 and PC2.



9.2 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 7.2.
3. For configuring DHCP server in R1 follow the steps in Section 8.2.
4. Configuring R2 as DHCP relay

   R2(config)# interface f1/0
   R2(config-if)# ip helper-address 172.16.12.1

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

9.3 Analyses

1. Show the IP addresses assigned via DHCP

solution:- show ip interface brief

2. Show the routing tables in R1 and R2. → show ip route
3. Show DHCP server statistics. → show ip dhcp server statistics
4. Show DHCP server's pool information. → show ip dhcp pool
5. 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. Show the ping operation by pinging PC2 from PC1. Show packet capture and write port numbers, IP addresses of each Echo request and reply. Explain ping statistics.

5) Solution :- start capture in the link between PC2 & R1 which is configured as DHCP server.

In PC1 console, give PC1> ip dhcp -d

check packets exchanged between PC2 & server.

6) Solution :- start capture in the link between PC2 & R1. In PC2 console, give ping IP address of PC1 obtained using DHCP

check packets exchanged between PC1 & PC2.