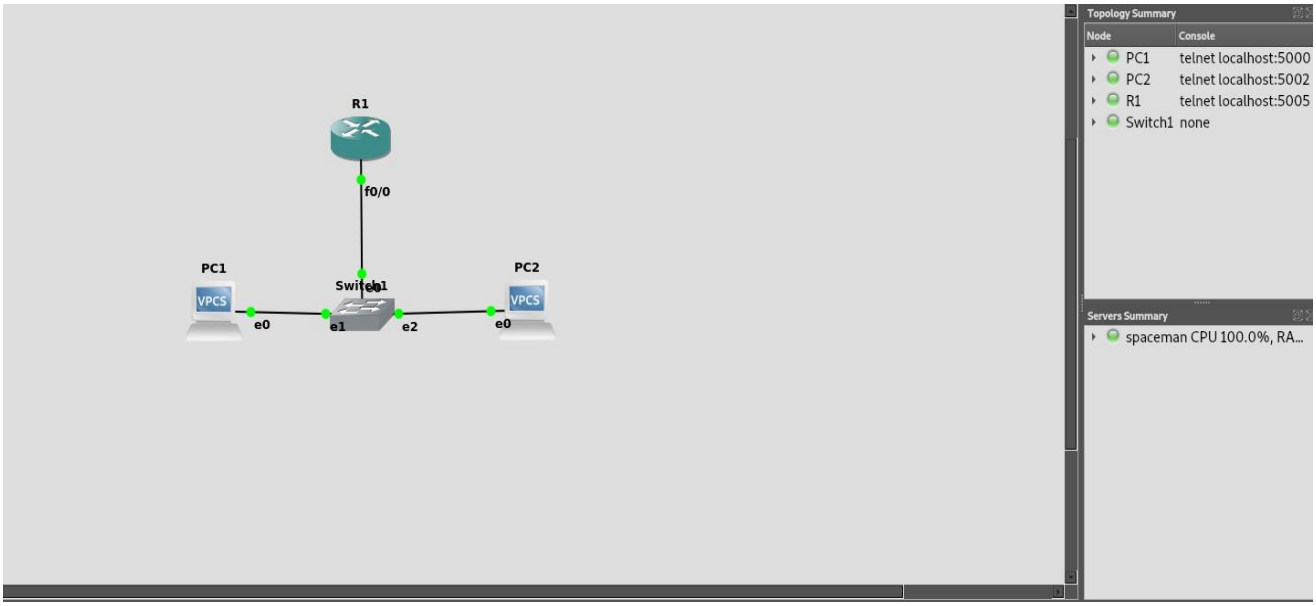
Q1. Configure two VMs that will be used to test connectivity from end to end and R1 will serve as a DHCP server to distribute IP addresses. The diagram below details the current setup:



Router Configuration

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#IP dhcp pool NAME
R1(dhcp-config)#Network 192.168.3.0 255.255.255.0
R1(dhcp-config)#Default-router 192.168.3.1
R1(dhcp-config)#write
               ^
% Invalid input detected at '^' marker.

R1(dhcp-config)#exit
R1(config)#write
           ^
% Invalid input detected at '^' marker.

R1(config)#exit
R1#wer
*Mar  1 00:06:23.487: %SYS-5-CONFIG_I: Configured from console by console
R1#write
Building configuration...
[OK]
R1#interface f0/0
    ^
% Invalid input detected at '^' marker.

R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#interface f0/0
R1(config-if)#no shutdown
R1(config-if)#ip add
*Mar  1 00:07:04.891: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar  1 00:07:05.891: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config-if)#ip address 192.168.3.1 255.255.255.0
R1(config-if)#exit
R1(config)#exit
R1#write
*Mar  1 00:07:33.795: %SYS-5-CONFIG_I: Configured from console by console
R1#write
Building configuration...
[OK]
R1#
```

```
PC1> dhcp
DDORRA IP 192.168.3.2/24 GW 192.168.3.1

PC1>
```

```
PC2> dhcp
DDORA IP 192.168.3.3/24 GW 192.168.3.1

PC2>
```

```
R1#show ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

C    192.168.3.0/24 is directly connected, FastEthernet0/0
R1#
```

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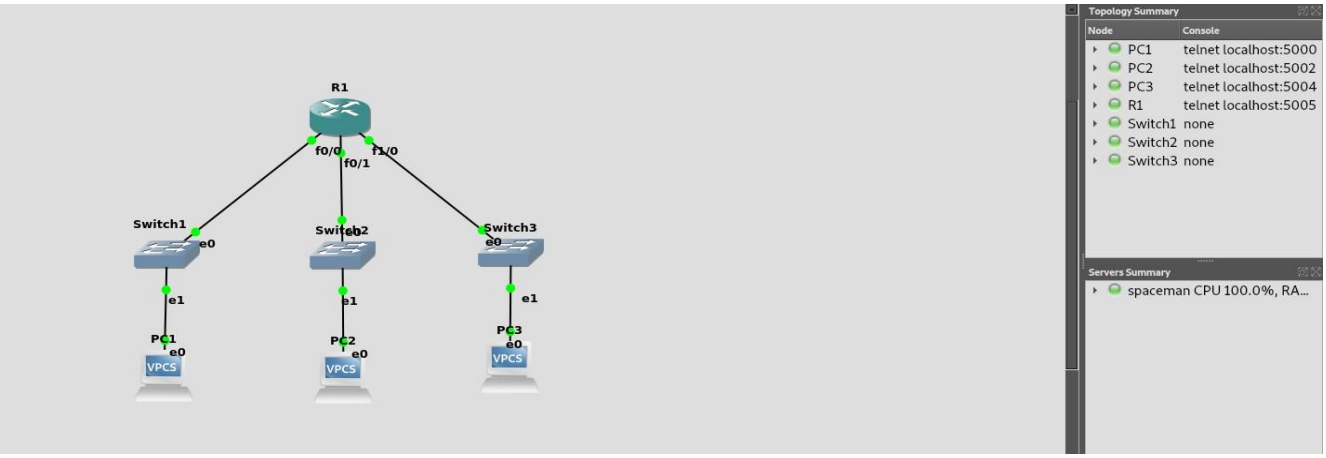
dhcp

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	0.0.0.0	255.255.255.255	DHCP	406	DHCP Discover - Transaction ID 0xf24c9551
3	0.999784	0.0.0.0	255.255.255.255	DHCP	406	DHCP Discover - Transaction ID 0xf24c9551
4	2.011981	192.168.3.1	192.168.3.2	DHCP	342	DHCP Offer - Transaction ID 0xf24c9551
5	2.022770	192.168.3.1	192.168.3.2	DHCP	342	DHCP Offer - Transaction ID 0xf24c9551
6	3.111829	0.0.0.0	255.255.255.255	DHCP	406	DHCP Discover - Transaction ID 0xc29ff01a
8	4.000236	0.0.0.0	255.255.255.255	DHCP	406	DHCP Request - Transaction ID 0xf24c9551
9	4.113042	0.0.0.0	255.255.255.255	DHCP	406	DHCP Discover - Transaction ID 0xc29ff01a
10	5.000347	0.0.0.0	255.255.255.255	DHCP	406	DHCP Request - Transaction ID 0xf24c9551
11	5.131050	192.168.3.1	192.168.3.2	DHCP	342	DHCP ACK - Transaction ID 0xf24c9551
12	5.152546	192.168.3.1	192.168.3.2	DHCP	342	DHCP ACK - Transaction ID 0xf24c9551

```
› Frame 1: 406 bytes on wire (3248 bits), 406 bytes captured (3248 bits) on interface -, id 0
› Ethernet II, Src: Private_66:68:00 (00:50:79:66:68:00), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
› Internet Protocol Version 4, Src: 0.0.0.0, Dst: 255.255.255.255
› User Datagram Protocol, Src Port: 68, Dst Port: 67
› Dynamic Host Configuration Protocol (Discover)
```

```
0000  ff ff ff ff ff ff 00 50  79 66 68 00 08 00 45 10   ·······P yfh···E·
0010  01 88 00 00 00 00 10 11  a9 56 00 00 00 00 ff ff   ·········V ····
0020  ff ff 00 44 00 43 01 74  62 cd 01 01 06 00 f2 4c   ···D·C·t b·····L
0030  95 51 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ·Q·····  ········
0040  00 00 00 00 00 00 00 50  79 66 68 00 00 00 00 00   ·······P yfh·····
0050  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ········ ········
0060  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ········ ········
```

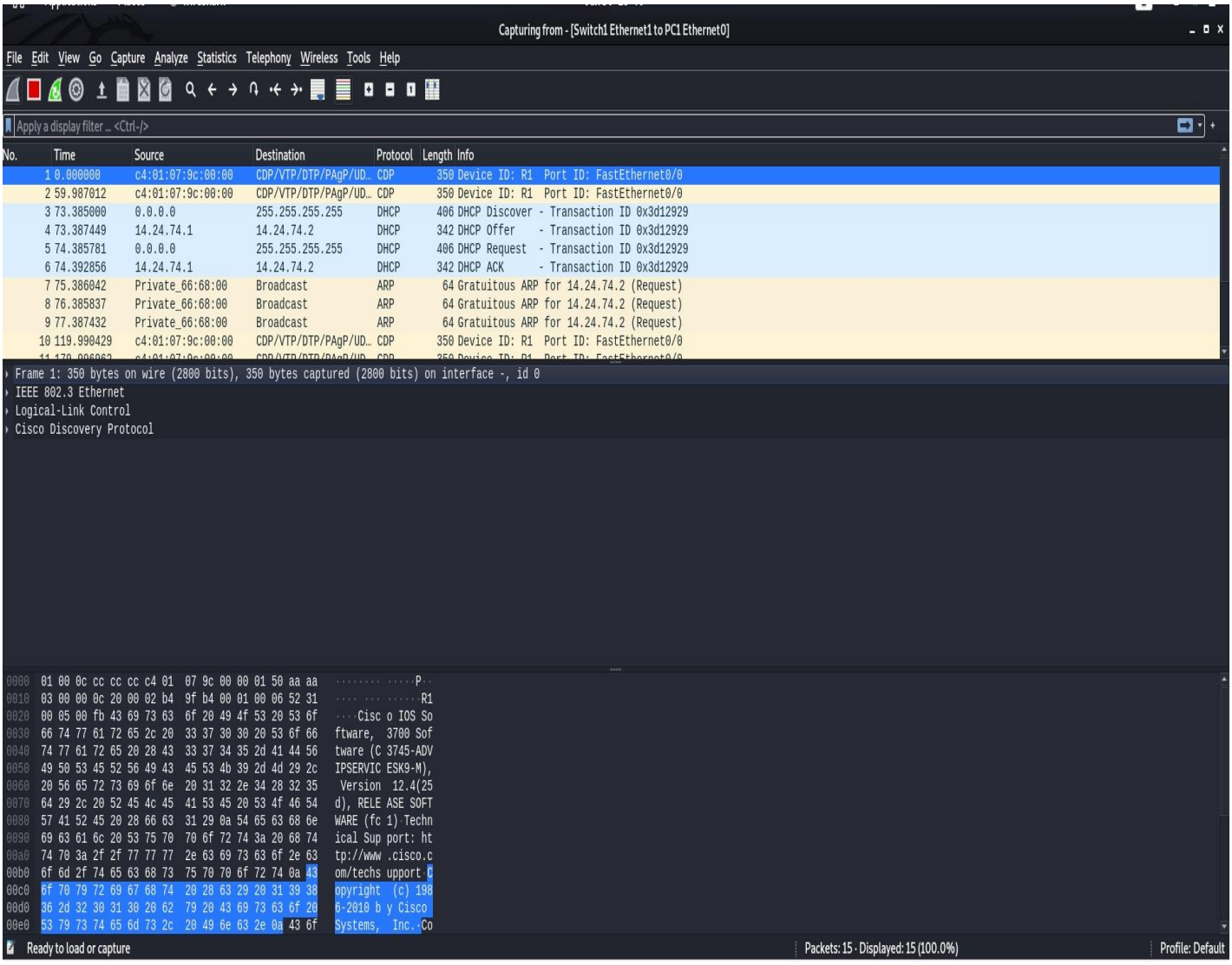
Ques 2. Configure DHCP server at R1 for the PART 2 Q2 Subnet configuration and topology. An organization is granted a block of addresses with the beginning address 14.24.74.0/24. The organization needs to have 3 subblocks of addresses to use in its three subnets: one subblock of 10 addresses, one subblock of 60 addresses, and one subblock of 120 addresses. Design the subblocks. Use the topology shown below.

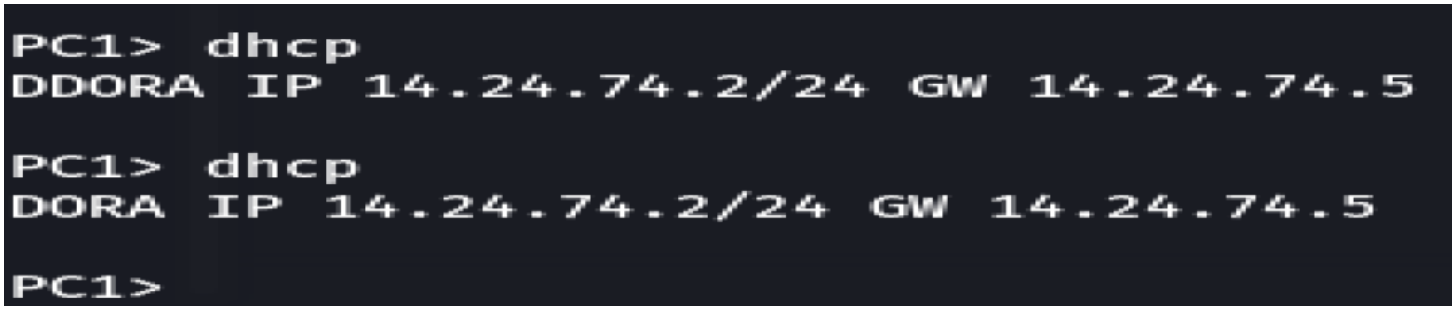


Router configuration (shown only for interface f0/0, since other interfaces configuration commands are equally similar):

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#IP dhcp pool r1pool
R1(dhcp-config)#netwoork 14.24.74.4 255.255.255.0
                 ^
% Invalid input detected at '^' marker.

R1(dhcp-config)#network 14.24.74.4 255.255.255.0
R1(dhcp-config)#default-router 14.24.74.5
R1(dhcp-config)#exit
R1(config)#exit
R1#wr
*Mar  1 00:04:17.771: %SYS-5-CONFIG_I: Configured from console by console
R1#write
Building configuration...
[OK]
R1#interface f0/0
   ^
% Invalid input detected at '^' marker.

R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#interface f0/0
R1(config-if)#no shutdown
R1(config-if)#ip addre
*Mar  1 00:06:01.075: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar  1 00:06:02.075: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config-if)#ip address 14.24.74.1 255.255.255.0
R1(config-if)#exit
R1(config)#exit
R1#w
*Mar  1 00:06:34.567: %SYS-5-CONFIG_I: Configured from console by console
```

```
R1#show ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

     14.0.0.0/24 is subnetted, 1 subnets
C       14.24.74.0 is directly connected, FastEthernet0/0
R1#
```





(Note – All procedures carefully done on GNS3, Wireshark and CISCO 3745 router)