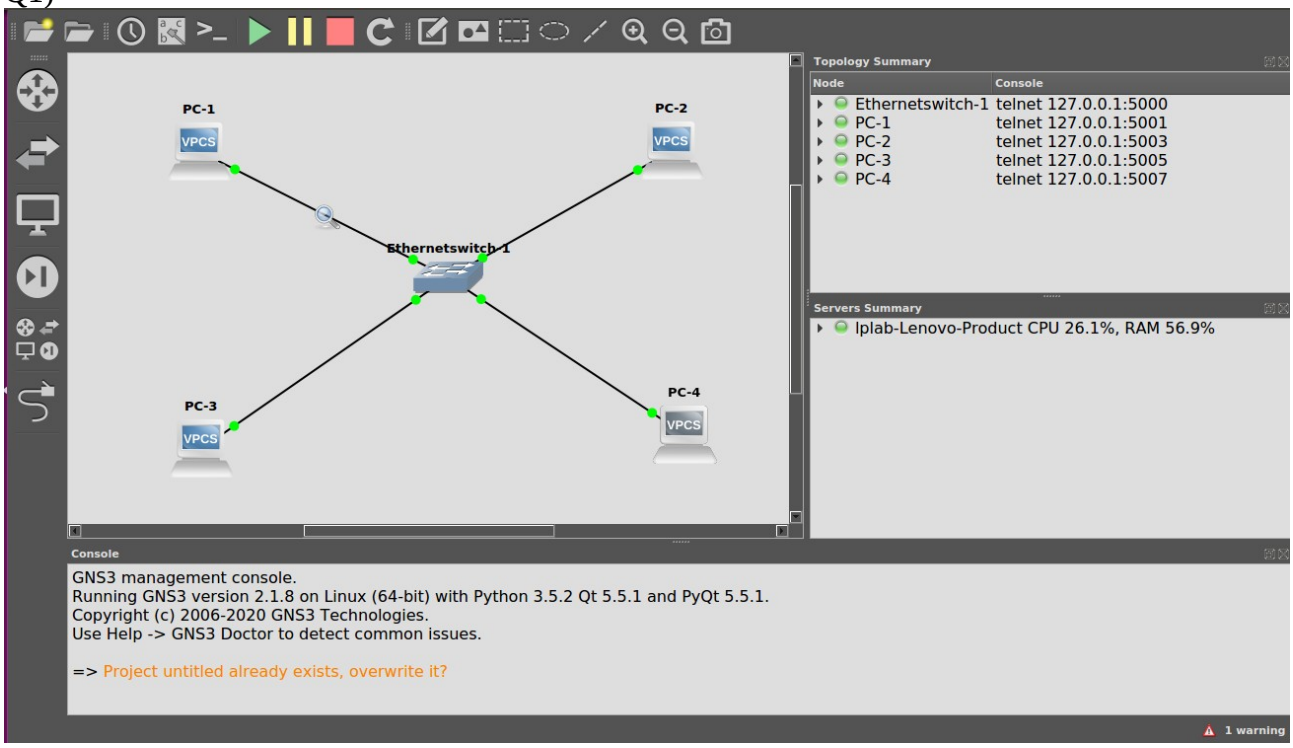
ADITYA PRADHAN 180905350 CSE D

Q1)



PC1

```
PC-1> ip 10.0.1.11/24 10.0.1.1
Checking for duplicate address...
PC1 : 10.0.1.11 255.255.255.0 gateway 10.0.1.1
```

PC2

```
PC-2> ip 10.0.1.12 10.0.1.1
Checking for duplicate address...
PC1 : 10.0.1.12 255.255.255.0 gateway 10.0.1.1
```

PC3

```
PC-3> ip 10.0.1.13/24 10.0.1.1
Checking for duplicate address...
PC1 : 10.0.1.13 255.255.255.0 gateway 10.0.1.1
```

PC4

```
PC-4>  ip 10.0.1.14/24 10.0.1.1
Checking for duplicate address...
PC1 : 10.0.1.14 255.255.255.0 gateway 10.0.1.1
```

a) show arp

```
PC-1> show arp

arp table is empty
```

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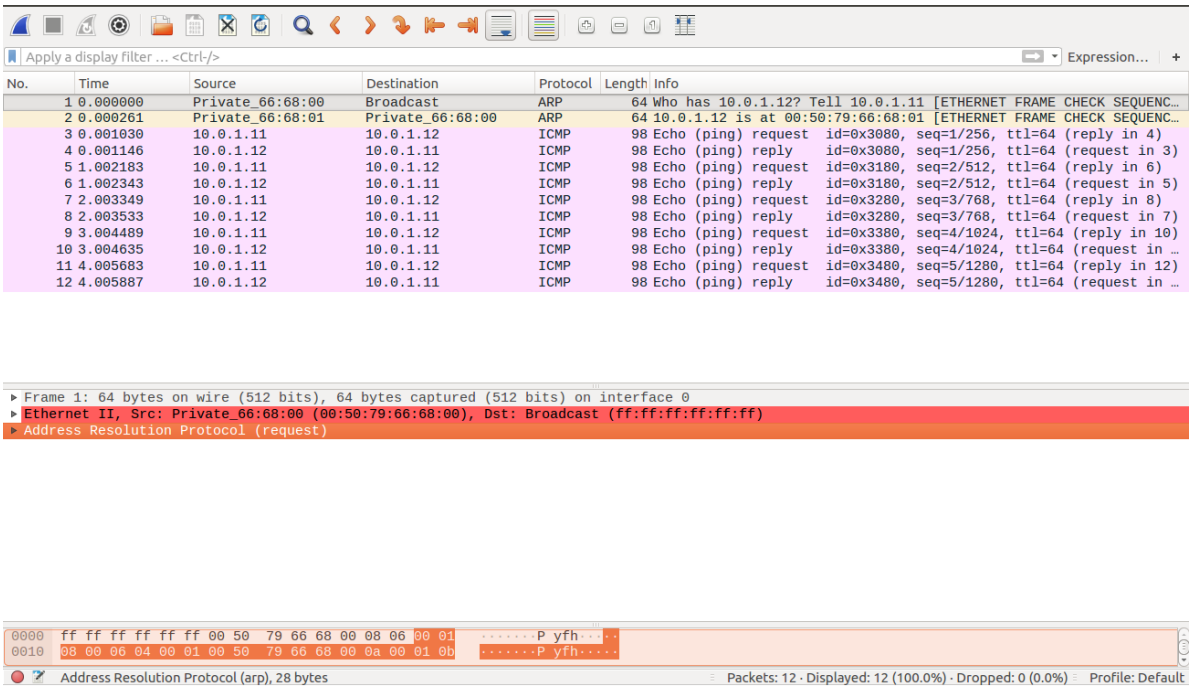
Ping and arp

```
PC-1> ping 10.0.1.12 -c3
84 bytes from 10.0.1.12 icmp_seq=1 ttl=64 time=0.257 ms
84 bytes from 10.0.1.12 icmp_seq=2 ttl=64 time=0.338 ms
84 bytes from 10.0.1.12 icmp_seq=3 ttl=64 time=0.360 ms
84 bytes from 10.0.1.12 icmp_seq=4 ttl=64 time=0.310 ms
84 bytes from 10.0.1.12 icmp_seq=5 ttl=64 time=0.414 ms

PC-1> show arp

00:50:79:66:68:01  10.0.1.12 expires in 85 seconds
```

after 2mins arp

```
PC-1> show arp

arp table is empty
```

Wireshark screen



after arp filter

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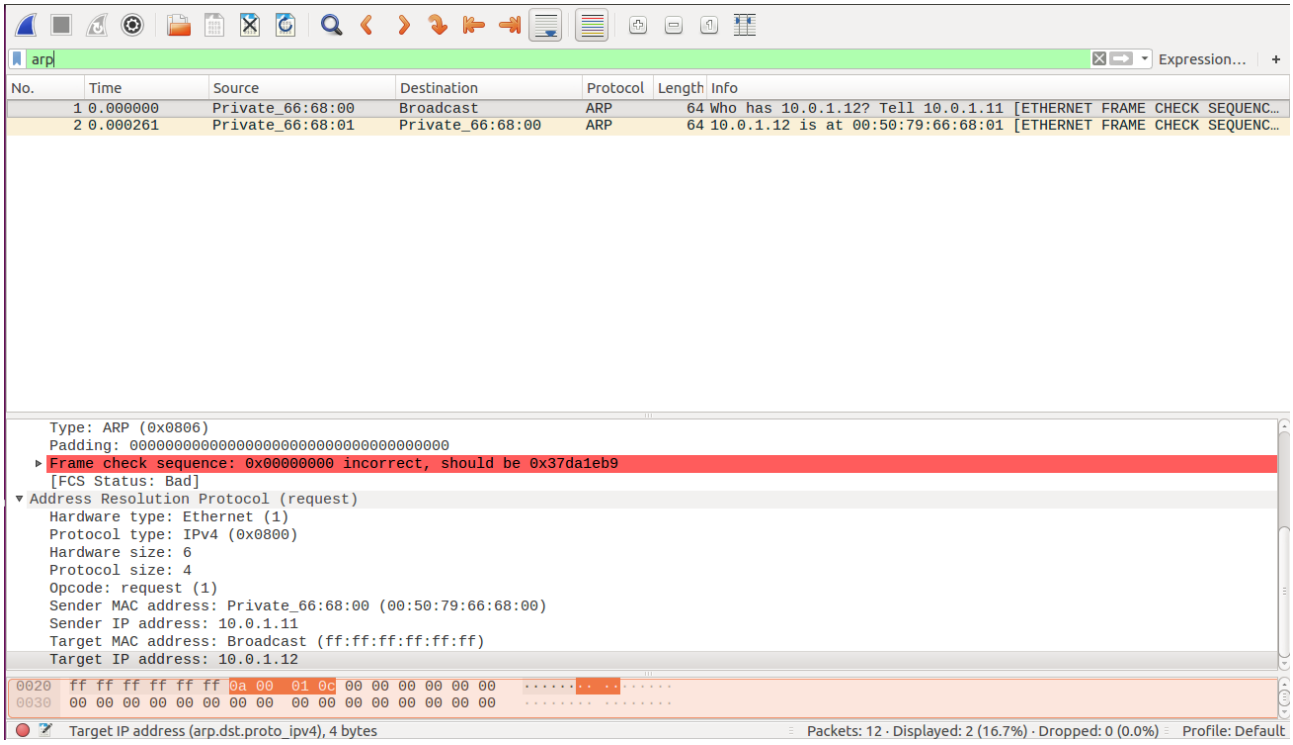
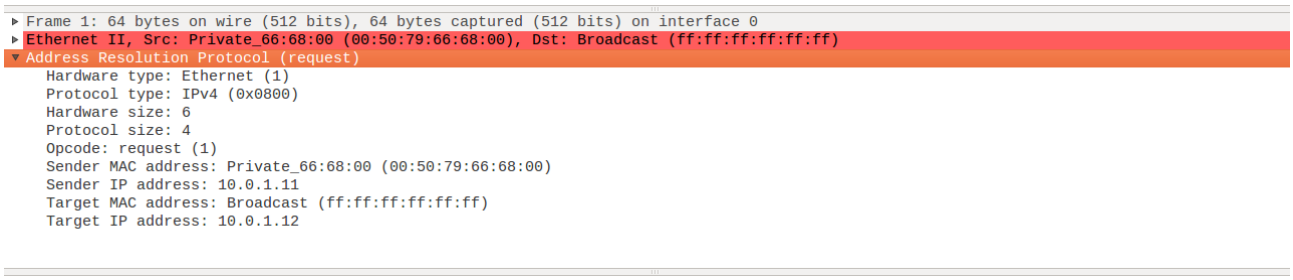


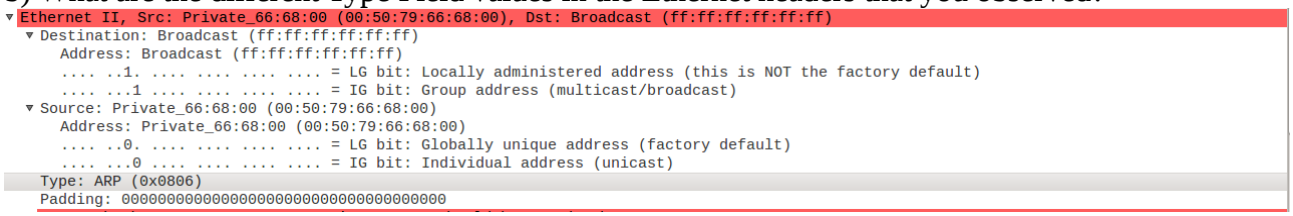
Answers

a) Destination MAC address of an ARP Request packet



Target MAC address: Broadcast (ff:ff:ff:ff:ff:ff)
Target IP address: 10.0.1.12

b) What are the different Type Field values in the Ethernet headers that you observed?



Type: ARP (0x0806)

c) Which Ping operations were successfull
All ping operations were successfull as all have the same sub net mask

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saved wireshark output file

```
student@lplab-Lenovo-Product:~/180905350/cn/week2/lab4$ cat wireshark.out
No.     Time           Source                Destination           Protocol Leng
th Info
      1 0.000000       Private_66:68:00      Broadcast             ARP      64
   Who has 10.0.1.12? Tell 10.0.1.11 [ETHERNET FRAME CHECK SEQUENCE INCORRECT]

Frame 1: 64 bytes on wire (512 bits), 64 bytes captured (512 bits) on interface
0
Ethernet II, Src: Private_66:68:00 (00:50:79:66:68:00), Dst: Broadcast (ff:ff:ff
:ff:ff:ff)
Address Resolution Protocol (request)

No.     Time           Source                Destination           Protocol Leng
th Info
      2 0.000261       Private_66:68:01      Private_66:68:00      ARP      64
   10.0.1.12 is at 00:50:79:66:68:01 [ETHERNET FRAME CHECK SEQUENCE INCORRECT]

Frame 2: 64 bytes on wire (512 bits), 64 bytes captured (512 bits) on interface
0
Ethernet II, Src: Private_66:68:01 (00:50:79:66:68:01), Dst: Private_66:68:00 (0
0:50:79:66:68:00)
Address Resolution Protocol (reply)
student@lplab-Lenovo-Product:~/180905350/cn/week2/lab4$
```

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Q4.2)

Ping
i. pc1 – pc3

```
PC-1> ping 10.0.1.120/24
84 bytes from 10.0.1.120 icmp_seq=1 ttl=64 time=0.307 ms
84 bytes from 10.0.1.120 icmp_seq=2 ttl=64 time=0.326 ms
84 bytes from 10.0.1.120 icmp_seq=3 ttl=64 time=0.328 ms
84 bytes from 10.0.1.120 icmp_seq=4 ttl=64 time=0.273 ms
84 bytes from 10.0.1.120 icmp_seq=5 ttl=64 time=0.385 ms
```

ii. pc1-pc2

```
PC-1> ping 10.0.1.101/28
84 bytes from 10.0.1.101 icmp_seq=1 ttl=64 time=0.244 ms
84 bytes from 10.0.1.101 icmp_seq=2 ttl=64 time=0.280 ms
84 bytes from 10.0.1.101 icmp_seq=3 ttl=64 time=0.478 ms
84 bytes from 10.0.1.101 icmp_seq=4 ttl=64 time=0.352 ms
84 bytes from 10.0.1.101 icmp_seq=5 ttl=64 time=0.285 ms
```

iii. From PC1 pingPC4.

```
PC-1> ping 10.0.1.121/28
10.0.1.121 icmp_seq=1 timeout
10.0.1.121 icmp_seq=2 timeout
10.0.1.121 icmp_seq=3 timeout
10.0.1.121 icmp_seq=4 timeout
10.0.1.121 icmp_seq=5 timeout
```

iv. From PC4 pingPC1.

```
PC-4> ping 10.0.1.100/24
No gateway found
```

v. From PC2 ping PC4.

```
PC-2> ping  10.0.1.121/28
No gateway found
```

vi. From PC2 ping PC3.

```
PC-2> ping 10.0.1.120/24
No gateway found
```

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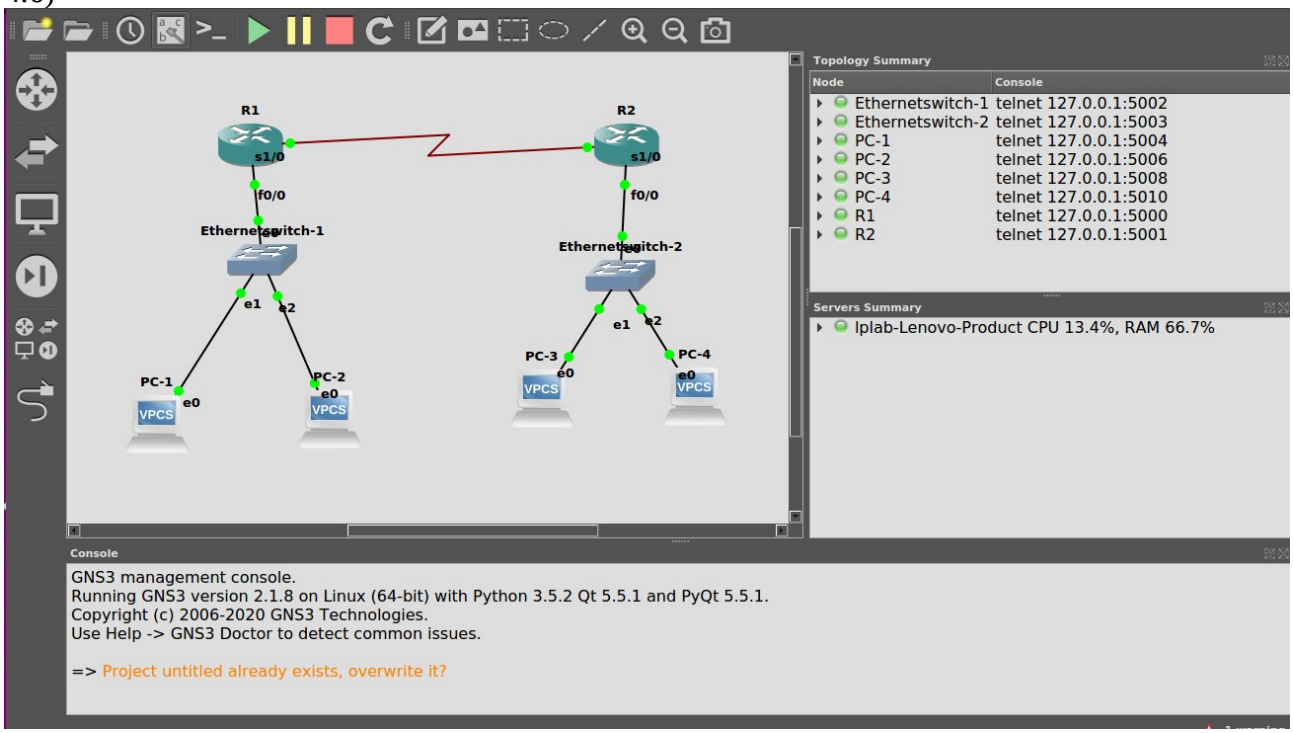
4.6)



Configuring r1

```
*Dec 12 15:38:39.287: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Dec 12 15:38:39.323: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Dec 12 15:38:39.355: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Dec 12 15:38:39.363: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
R1#
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int f0/0
R1(config-if)#ip addr 10.0.0.1 255.255.255.0
R1(config-if)#no shut
R1(config-if)#
*Dec 12 15:40:47.671: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
R1(config-if)#
*Dec 12 15:40:47.671: %ENTITY_ALARM-6-INFO: CLEAR INFO Fa0/0 Physical Port Administrative State Down
*Dec 12 15:40:48.671: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config-if)#exit
R1(config)#ip s1/0
                ^
% Invalid input detected at '^' marker.

R1(config)#int s1/0
R1(config-if)#ip addr 20.0.0.1 255.255.255.0
R1(config-if)#no shut
R1(config-if)#
*Dec 12 15:42:26.883: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up
R1(config-if)#
*Dec 12 15:42:26.883: %ENTITY_ALARM-6-INFO: CLEAR INFO Se1/0 Physical Port Administrative State Down
R1(config-if)#
*Dec 12 15:42:27.887: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
R1(config-if)#exit
R1(config)#exit
R1#
*Dec 12 15:42:47.031: %SYS-5-CONFIG_I: Configured from console by console
R1#show ip interface b
*Dec 12 15:42:57.243: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
R1#show ip interface brief
Interface                  IP-Address      OK? Method Status                Protocol
FastEthernet0/0            10.0.0.1        YES manual up                    up
Serial1/0                  20.0.0.1        YES manual up                    down
Serial1/1                  unassigned      YES unset  administratively down down
Serial1/2                  unassigned      YES unset  administratively down down
Serial1/3                  unassigned      YES unset  administratively down down
R1#
```

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Configuring R2

```
R2#
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#int f0/
R2(config)#int f0/0
R2(config-if)#ip addr 30.0.0.1 255.255.255.0
R2(config-if)#no shut
R2(config-if)#
*Dec 12 15:45:11.683: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
R2(config-if)#
*Dec 12 15:45:11.683: %ENTITY_ALARM-6-INFO: CLEAR INFO Fa0/0 Physical Port Administrative State Down
*Dec 12 15:45:12.683: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R2(config-if)#exit
R2(config)#int s1/0
R2(config-if)#ip addr 20.0.0.2 255.255.255.0
R2(config-if)#no shut
R2(config-if)#
*Dec 12 15:46:50.899: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up
R2(config-if)#
*Dec 12 15:46:50.899: %ENTITY_ALARM-6-INFO: CLEAR INFO Se1/0 Physical Port Administrative State Down
R2(config-if)#
*Dec 12 15:46:51.903: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
R2(config-if)#exit
R2(config)#show ip int brief
          ^
% Invalid input detected at '^' marker.

R2(config)#exit
R2#sho
*Dec 12 15:49:03.591: %SYS-5-CONFIG_I: Configured from console by console
R2#show ip interface brief
Interface                  IP-Address      OK? Method Status                Protocol
FastEthernet0/0            30.0.0.1        YES manual up                    up
Serial1/0                  20.0.0.2        YES manual up                    up
Serial1/1                  unassigned      YES unset  administratively down down
Serial1/2                  unassigned      YES unset  administratively down down
Serial1/3                  unassigned      YES unset  administratively down down
R2#
```

Configuring pc1

```
PC-1> ip 10.0.0.10 255.255.255.0 10.0.0.1
Checking for duplicate address...
PC1 : 10.0.0.10 255.255.255.0 gateway 10.0.0.1
```

Configuring pc2

```
PC-2> ip 10.0.0.20 255.255.255.0 10.0.0.1
Checking for duplicate address...
PC1 : 10.0.0.20 255.255.255.0 gateway 10.0.0.1

PC-2>
```

Configuring pc3

```
PC-3> ip 30.0.0.10 255.255.255.0 30.0.0.1
Checking for duplicate address...
PC1 : 30.0.0.10 255.255.255.0 gateway 30.0.0.1
```

Configuring pc4

```
PC-4> ip 30.0.0.20 255.255.255.0 30.0.0.1
Checking for duplicate address...
PC1 : 30.0.0.20 255.255.255.0 gateway 30.0.0.1
```

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Configuring Routing table
R2

```
R2(config)#ip route 10.0.0.0 255.255.255.0 20.0.0.1
R2(config)#exit
R2#show ip interface brief
*Dec 12 16:01:30.083: %SYS-5-CONFIG_I: Configured from console by console
R2#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

     20.0.0.0/24 is subnetted, 1 subnets
C       20.0.0.0 is directly connected, Serial1/0
     10.0.0.0/24 is subnetted, 1 subnets
S       10.0.0.0 [1/0] via 20.0.0.1
     30.0.0.0/24 is subnetted, 1 subnets
C       30.0.0.0 is directly connected, FastEthernet0/0
R2#
```

R1

```
R1(config)#ip route 30.0.0.0 255.255.255.0 20.0.0.2
R1(config)#exit
R1#show ip interface  route
*Dec 12 16:09:53.187: %SYS-5-CONFIG_I: Configured from console by console
R1#show ip interface  route
                      ^
% Invalid input detected at '^' marker.

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

     20.0.0.0/24 is subnetted, 1 subnets
C       20.0.0.0 is directly connected, Serial1/0
     10.0.0.0/24 is subnetted, 1 subnets
C       10.0.0.0 is directly connected, FastEthernet0/0
     30.0.0.0/24 is subnetted, 1 subnets
S       30.0.0.0 [1/0] via 20.0.0.2
R1#
```

Pinging pc1 from pc4

```
PC-4> ping 10.0.0.10
84 bytes from 10.0.0.10 icmp_seq=1 ttl=62 time=41.493 ms
84 bytes from 10.0.0.10 icmp_seq=2 ttl=62 time=35.022 ms
84 bytes from 10.0.0.10 icmp_seq=3 ttl=62 time=25.675 ms
84 bytes from 10.0.0.10 icmp_seq=4 ttl=62 time=25.248 ms
84 bytes from 10.0.0.10 icmp_seq=5 ttl=62 time=24.995 ms

PC-4>
```

It gives no arp

Pinging pc1 from pc2

```
PC-2> ping 10.0.0.10
84 bytes from 10.0.0.10 icmp_seq=1 ttl=64 time=0.285 ms
84 bytes from 10.0.0.10 icmp_seq=2 ttl=64 time=0.453 ms
84 bytes from 10.0.0.10 icmp_seq=3 ttl=64 time=0.380 ms
84 bytes from 10.0.0.10 icmp_seq=4 ttl=64 time=0.413 ms
84 bytes from 10.0.0.10 icmp_seq=5 ttl=64 time=0.358 ms
```

gives arp

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