

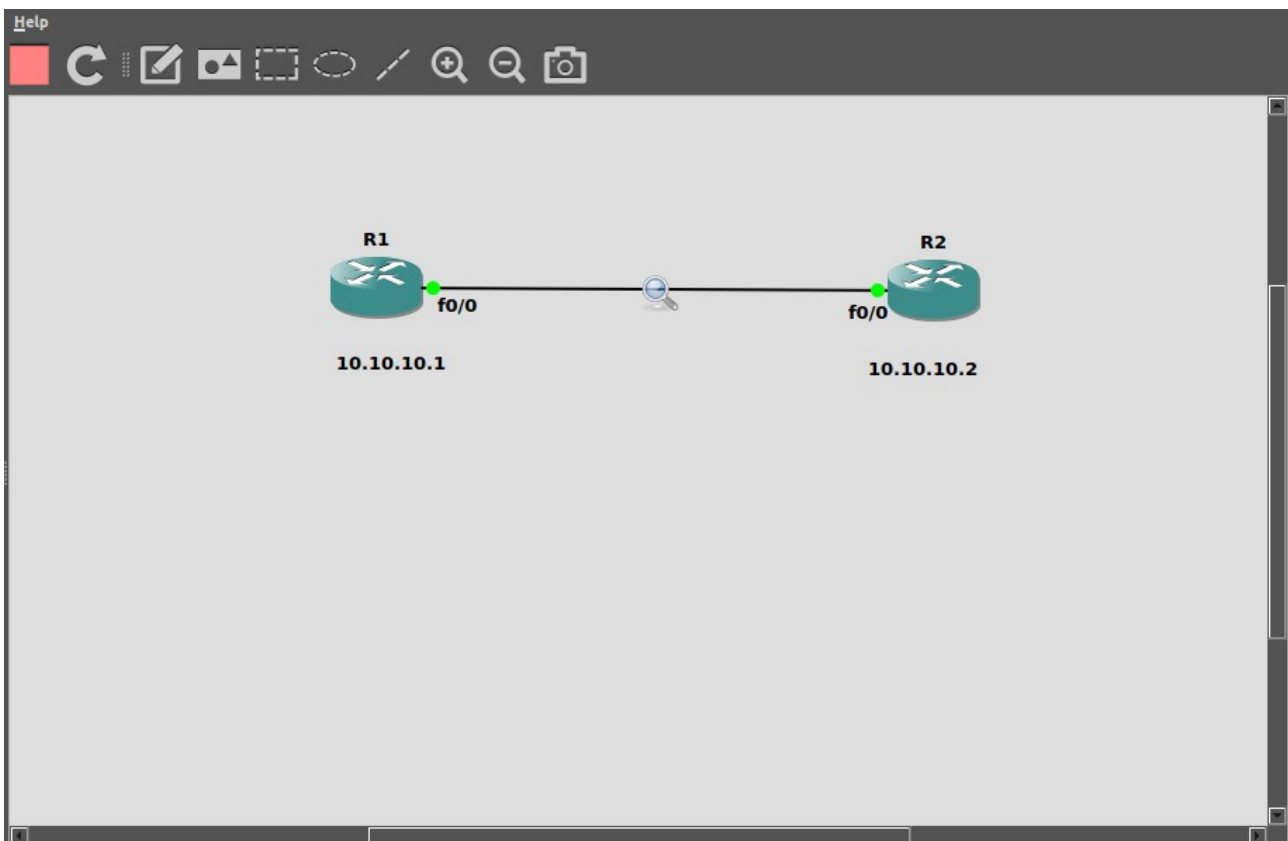
190905514
ROLLNO : 62

MOHAMMAD TOFIK
SECTION : C

BATCH : C3
SEM : 5th

-: CN-LAB-5 :-

LAB EXERCISE :



Router 1 Configuration :

```
R1
File Edit View Search Terminal Help
anged state to down
*Nov  6 07:56:11.299: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, ch
anged state to down
R1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int f0/0
R1(config-if)#ip address 10.10.10.1 255.255.255.0
R1(config-if)#no sh
R1(config-if)#exit
R1(config)#
*Nov  6 07:57:08.743: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to u
p
R1(config)#
*Nov  6 07:57:08.743: %ENTITY_ALARM-6-INFO: CLEAR INFO Fa0/0 Physical Port Administ
rative State Down
*Nov  6 07:57:09.743: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0
/0, changed state to up
R1(config)#exit
R1#i
*Nov  6 07:57:11.787: %SYS-5-CONFIG_I: Configured from console by console
R1#sh 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

    10.0.0.0/24 is subnetted, 1 subnets
C       10.10.10.0 is directly connected, FastEthernet0/0
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#ip domain lookup
R1(config)#ip name-server 10.10.10.2
R1(config)#ip route 0.0.0.0 0.0.0.0 10.10.10.2
R1(config)#exit
R1#
*Nov  6 08:02:02.623: %SYS-5-CONFIG_I: Configured from console by console
R1#sh 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
```

```
R1
File Edit View Search Terminal Help
R1(config)#ip domain lookup
R1(config)#ip name-server 10.10.10.2
R1(config)#ip route 0.0.0.0 0.0.0.0 10.10.10.2
R1(config)#exit
R1#
*Nov  6 08:02:02.623: %SYS-5-CONFIG_I: Configured from console by console
R1#sh 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 10.10.10.2 to network 0.0.0.0

    10.0.0.0/24 is subnetted, 1 subnets
C      10.10.10.0 is directly connected, FastEthernet0/0
S*    0.0.0.0/0 [1/0] via 10.10.10.2
R1#ping loopback.R2.com

Translating "loopback.R2.com"...domain server (10.10.10.2) [OK]

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 60/61/64 ms
R1#ping loopback.R2.com

Translating "loopback.R2.com"...domain server (10.10.10.2) [OK]

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 56/60/64 ms
R1#ping loopback.R2.com

Translating "loopback.R2.com"...domain server (10.10.10.2) [OK]

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 60/62/64 ms
R1#
```

R2 configuration :

```
R2
File Edit View Search Terminal Help
R2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#int f0/0
R2(config-if)#ip address 10.10.10.2 255.255.255.0
R2(config-if)#no sh
R2(config-if)#
*Nov  6 07:57:27.555: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to u
p
R2(config-if)#exit
*Nov  6 07:57:27.555: %ENTITY_ALARM-6-INFO: CLEAR INFO Fa0/0 Physical Port Administ
rative State Down
*Nov  6 07:57:28.555: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0
/0, changed state to up
R2(config-if)#exit
R2(config)#exit
R2#sh
*Nov  6 07:57:34.171: %SYS-5-CONFIG_I: Configured from console by console
R2#sh 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

    10.0.0.0/24 is subnetted, 1 subnets
C       10.10.10.0 is directly connected, FastEthernet0/0
R2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#ip dns server
R2(config)#ip host loopback.R2.com 2.2.2.2
R2(config)#interface loopback1
R2(config-if)#
*Nov  6 07:58:35.463: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, ch
anged state to up
R2(config-if)#ip address 2.2.2.2 255.255.255.255
R2(config-if)#exit
R2(config)#exit
R2#
*Nov  6 07:59:00.807: %SYS-5-CONFIG_I: Configured from console by console
R2#sh ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
```

```
R2
File Edit View Search Terminal Help
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

10.0.0.0/24 is subnetted, 1 subnets
C 10.10.10.0 is directly connected, FastEthernet0/0
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip dns server
R2(config)#ip host loopback.R2.com 2.2.2.2
R2(config)#interface loopback1
R2(config-if)#
*Nov 6 07:58:35.463: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, changed state to up
R2(config-if)#ip address 2.2.2.2 255.255.255.255
R2(config-if)#exit
R2(config)#exit
R2#
*Nov 6 07:59:00.807: %SYS-5-CONFIG_I: Configured from console by console
R2#sh 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

2.0.0.0/32 is subnetted, 1 subnets
C 2.2.2.2 is directly connected, Loopback1
10.0.0.0/24 is subnetted, 1 subnets
C 10.10.10.0 is directly connected, FastEthernet0/0
R2#ping loopback.R2.com

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/4 ms
R2#
```

CAPTURING BY WIRESHARK :

Wireshark packet capture showing a DNS query and response. The packet list shows a standard query (24) and a standard query response (25). The packet details pane shows the query for 'loopback.R2.com' type A, class IN. The packet bytes pane shows the raw data.

No.	Time	Source	Destination	Protocol	Length	Info
19	17.541672	ca:02:0b:82:00:00	ca:02:0b:82:00:00	LOOP	60	Reply
20	20.406966	ca:01:0b:73:00:00	ca:01:0b:73:00:00	LOOP	60	Reply
21	28.055261	ca:02:0b:82:00:00	ca:02:0b:82:00:00	LOOP	60	Reply
22	30.920625	ca:01:0b:73:00:00	ca:01:0b:73:00:00	LOOP	60	Reply
23	38.522994	ca:02:0b:82:00:00	ca:02:0b:82:00:00	LOOP	60	Reply
24	39.520966	10.10.10.1	10.10.10.2	DNS	75	Standard query 0x837c A loopback.R2.com
25	39.531208	10.10.10.2	10.10.10.1	DNS	91	Standard query response 0x837c A loopback.R2.com A 2.2.2.2
26	39.541239	10.10.10.1	2.2.2.2	ICMP	114	Echo (ping) request id=0x0008, seq=0/0, ttl=255 (reply in 27)
27	39.551708	2.2.2.2	10.10.10.1	ICMP	114	Echo (ping) reply id=0x0008, seq=0/0, ttl=255 (request in 26)
28	39.561568	10.10.10.1	2.2.2.2	ICMP	114	Echo (ping) request id=0x0008, seq=1/256, ttl=255 (reply in 29)
29	39.571928	2.2.2.2	10.10.10.1	ICMP	114	Echo (ping) reply id=0x0008, seq=1/256, ttl=255 (request in 28)
30	39.581926	10.10.10.1	2.2.2.2	ICMP	114	Echo (ping) request id=0x0008, seq=2/512, ttl=255 (reply in 31)
31	39.592135	2.2.2.2	10.10.10.1	ICMP	114	Echo (ping) reply id=0x0008, seq=2/512, ttl=255 (request in 30)
32	41.025534	ca:01:0b:73:00:00	ca:01:0b:73:00:00	LOOP	60	Reply

Transaction ID: 0x837c
Flags: 0x0100 Standard query
Questions: 1
Answer RRs: 0
Authority RRs: 0
Additional RRs: 0
Queries:
 loopback.R2.com: type A, class IN
 Name: loopback.R2.com
 [Name Length: 15]
 [Label Count: 3]
 Type: A (Host Address) (1)
 Class: IN (0x0001)
[Response In: 25]

Number of answers in packet (dns.count.answers), 2 bytes

Packets: 34 · Displayed: 34 (100.0%) · Dropped: 0 (0.0%) Profile: Default

Wireshark packet capture showing a DNS query and response. The packet list shows a standard query (24) and a standard query response (25). The packet details pane shows the query for 'loopback.R2.com' type A, class IN. The packet bytes pane shows the raw data.

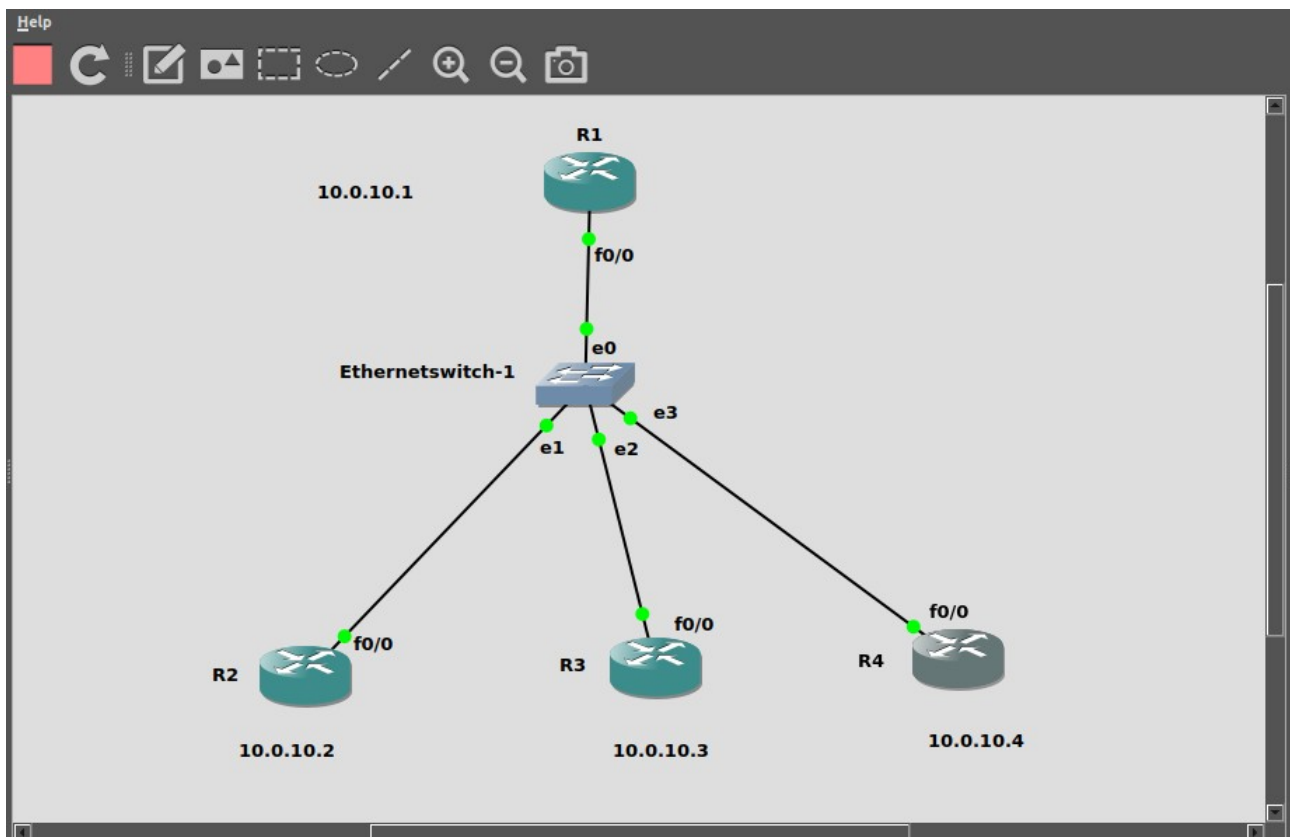
No.	Time	Source	Destination	Protocol	Length	Info
19	17.541672	ca:02:0b:82:00:00	ca:02:0b:82:00:00	LOOP	60	Reply
20	20.406966	ca:01:0b:73:00:00	ca:01:0b:73:00:00	LOOP	60	Reply
21	28.055261	ca:02:0b:82:00:00	ca:02:0b:82:00:00	LOOP	60	Reply
22	30.920625	ca:01:0b:73:00:00	ca:01:0b:73:00:00	LOOP	60	Reply
23	38.522994	ca:02:0b:82:00:00	ca:02:0b:82:00:00	LOOP	60	Reply
24	39.520966	10.10.10.1	10.10.10.2	DNS	75	Standard query 0x837c A loopback.R2.com
25	39.531208	10.10.10.2	10.10.10.1	DNS	91	Standard query response 0x837c A loopback.R2.com A 2.2.2.2
26	39.541239	10.10.10.1	2.2.2.2	ICMP	114	Echo (ping) request id=0x0008, seq=0/0, ttl=255 (reply in 27)
27	39.551708	2.2.2.2	10.10.10.1	ICMP	114	Echo (ping) reply id=0x0008, seq=0/0, ttl=255 (request in 26)
28	39.561568	10.10.10.1	2.2.2.2	ICMP	114	Echo (ping) request id=0x0008, seq=1/256, ttl=255 (reply in 29)
29	39.571928	2.2.2.2	10.10.10.1	ICMP	114	Echo (ping) reply id=0x0008, seq=1/256, ttl=255 (request in 28)
30	39.581926	10.10.10.1	2.2.2.2	ICMP	114	Echo (ping) request id=0x0008, seq=2/512, ttl=255 (reply in 31)
31	39.592135	2.2.2.2	10.10.10.1	ICMP	114	Echo (ping) reply id=0x0008, seq=2/512, ttl=255 (request in 30)
32	41.025534	ca:01:0b:73:00:00	ca:01:0b:73:00:00	LOOP	60	Reply

[Name Length: 15]
[Label Count: 3]
Type: A (Host Address) (1)
Class: IN (0x0001)
Answers:
 loopback.R2.com: type A, class IN, addr 2.2.2.2
 Name: loopback.R2.com
 Type: A (Host Address) (1)
 Class: IN (0x0001)
 Time to live: 10
 Data length: 4
 Address: 2.2.2.2
[Request In: 24]
[Time: 0.010242000 seconds]

Number of answers in packet (dns.count.answers), 2 bytes

Packets: 34 · Displayed: 34 (100.0%) · Dropped: 0 (0.0%) Profile: Default

LAB EXERCISE :



R1 configuration :

```
R1
File Edit View Search Terminal Help
anged state to down
R1#config t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int f0/0
R1(config-if)#ip address 10.0.10.1 255.255.0.0
R1(config-if)#no sh
R1(config-if)#exit
*Nov  6 08:47:53.019: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to u
p
R1(config-if)#exit
R1(config)#
*Nov  6 08:47:53.019: %ENTITY_ALARM-6-INFO: CLEAR INFO Fa0/0 Physical Port Administ
rative State Down
*Nov  6 08:47:54.019: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0
/0, changed state to up
R1(config)#exit
```



```

R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip domain lookup
R1(config)#ip name-server 10.0.10.4
R1(config)#ip route 0.0.0.0 0.0.0.0 10.0.10.4
R1(config)#exit
R1#
*Nov  6 09:07:21.563: %SYS-5-CONFIG_I: Configured from console by console
R1#ping loopback.R4.com

Translating "loopback.R4.com"...domain server (10.0.10.4)
% Unrecognized host or address, or protocol not running.

R1#ping loopback.R4.comping loopback.R4.com

Translating "loopback.R4.comping"...domain server (10.0.10.4)
      ^
% Invalid input detected at '^' marker.

R1#ping loopback.R4.com

Translating "loopback.R4.com"...domain server (10.0.10.4) [OK]

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 60/61/68 ms
R1#

```

R2 configuration :

```

R2
File Edit View Search Terminal Help
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int fo/0
      ^
% Invalid input detected at '^' marker.

R2(config)#int f0/0
R2(config-if)#no sh
R2(config-if)#
*Nov  6 08:48:26.483: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to u
p
R2(config-if)#
*Nov  6 08:48:26.483: %ENTITY_ALARM-6-INFO: CLEAR INFO Fa0/0 Physical Port Administ
rative State Down
*Nov  6 08:48:27.483: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0
/0, changed state to up
R2(config-if)#int f0/0
R2(config-if)#ip address 10.0.10.2 255.255.0.0
R2(config-if)#no sh
R2(config-if)#exit
R2(config)#exit
R2#

```



```

R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip domain lookup
R2(config)#ip domain-server 10.0.10.4
      ^
% Invalid input detected at '^' marker.

R2(config)#ip name-server 10.0.10.4
R2(config)#ip route 0.0.0.0 0.0.0.0 10.0.10.4
R2(config)#exit
R2#
*Nov  6 09:10:10.519: %SYS-5-CONFIG_I: Configured from console by console
R2#ping loopback.R3.com

Translating "loopback.R3.com"...domain server (10.0.10.4)
% Unrecognized host or address, or protocol not running.

R2#ping loopback.R4.com

Translating "loopback.R4.com"...domain server (10.0.10.4) [OK]

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 60/60/64 ms
R2#

```

R3 configuration :

```

R3
File Edit View Search Terminal Help
anged state to down
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#int f0/0
R3(config-if)#ip address 10.0.10.4
% Incomplete command.

R3(config-if)#no sh
R3(config-if)#e
*Nov  6 08:49:27.963: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to u
p
R3(config-if)#eex
*Nov  6 08:49:27.963: %ENTITY_ALARM-6-INFO: CLEAR INFO Fa0/0 Physical Port Administ
rative State Down
*Nov  6 08:49:28.963: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0
/0, changed state to up
R3(config-if)#exit
R3(config)#exit

```

```
R3
File Edit View Search Terminal Help
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#ip dns server
R3(config)#ip host loopback.R3.com 2.2.2.2
R3(config)#interface loopback2
R3(config-if)#
*Nov 6 08:52:06.311: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback2, changed state to up
R3(config-if)#ip address 2.2.2.2 255.255.255.255
R3(config-if)#exit
R3(config)#exit
R3#
*Nov 6 08:54:21.647: %SYS-5-CONFIG_I: Configured from console by console
R3#sh 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

      2.0.0.0/32 is subnetted, 1 subnets
C      2.2.2.2 is directly connected, Loopback2
      10.0.0.0/16 is subnetted, 1 subnets
C      10.0.0.0 is directly connected, FastEthernet0/0
```

R4 configuration :

```
R4
File Edit View Search Terminal Help
R4#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R4(config)#int f0/0
R4(config-if)#ip address 10.0.10.4 255.255.0.0
R4(config-if)#no sh
R4(config-if)#ex
*Nov 6 09:03:25.315: %IP-4-DUPADDR: Duplicate address 10.0.10.4 on FastEthernet0/0, sourced by ca03.1103.0000
R4(config-if)#exit
R4(config)#
*Nov 6 09:03:27.287: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
R4(config)#e
*Nov 6 09:03:27.287: %ENTITY_ALARM-6-INFO: CLEAR INFO Fa0/0 Physical Port Administrative State Down
*Nov 6 09:03:28.287: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R4(config)#exit
```

```

R4
File Edit View Search Terminal Help
R4#config t
Enter configuration commands, one per line. End with CNTL/Z.
R4(config)#ip
*Nov  6 09:03:55.475: %IP-4-DUPADDR: Duplicate address 10.0.10.4 on FastEthernet0/0
, sourced by ca03.1103.0000
R4(config)#ip
*Nov  6 09:04:25.595: %IP-4-DUPADDR: Duplicate address 10.0.10.4 on FastEthernet0/0
, sourced by ca03.1103.0000
R4(config)#ip dns server
R4(config)#ip host loopback
*Nov  6 09:04:55.799: %IP-4-DUPADDR: Duplicate address 10.0.10.4 on FastEthernet0/0
, sourced by ca03.1103.0000
R4(config)#ip host loopback.R4.com 2.2.2.2
R4(config)#interface loopback4
*Nov  6 09:05:26.183: %IP-4-DUPADDR: Duplicate address 10.0.10.4 on FastEthernet0/0
, sourced by ca03.1103.0000
R4(config)#interface loopback4
R4(config-if)#ip
*Nov  6 09:05:33.559: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4, ch
anged state to up
R4(config-if)#ip address 2.2.2.2 255.255.255.255
R4(config-if)#e
*Nov  6 09:05:56.231: %IP-4-DUPADDR: Duplicate address 10.0.10.4 on FastEthernet0/0
, sourced by ca03.1103.0000
R4(config-if)#exit
R4(config)#exit

```

```

R4#sh 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

    2.0.0.0/32 is subnetted, 1 subnets
C       2.2.2.2 is directly connected, Loopback4
    10.0.0.0/16 is subnetted, 1 subnets
C       10.0.0.0 is directly connected, FastEthernet0/0
R4#ping loopback.R4.com

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/4 ms
R4#

```

Capturing By Wireshark :

The image shows a Wireshark packet capture window titled "*Standard input [R1 FastEthernet0/0 to Ethernetswitch-1 Ethernet0]". The packet list shows several ARP requests and replies. Packet 31 is highlighted, showing a "60 Reply" from source "ca:01:10:d1:00:00" to destination "ca:01:10:d1:00:00". The packet details pane shows the Ethernet II header, source and destination MAC addresses, and the Configuration Test Protocol (loopback) with skipCount: 0 and Relevant function: Reply (1). The packet bytes pane shows the raw data in hexadecimal and ASCII.

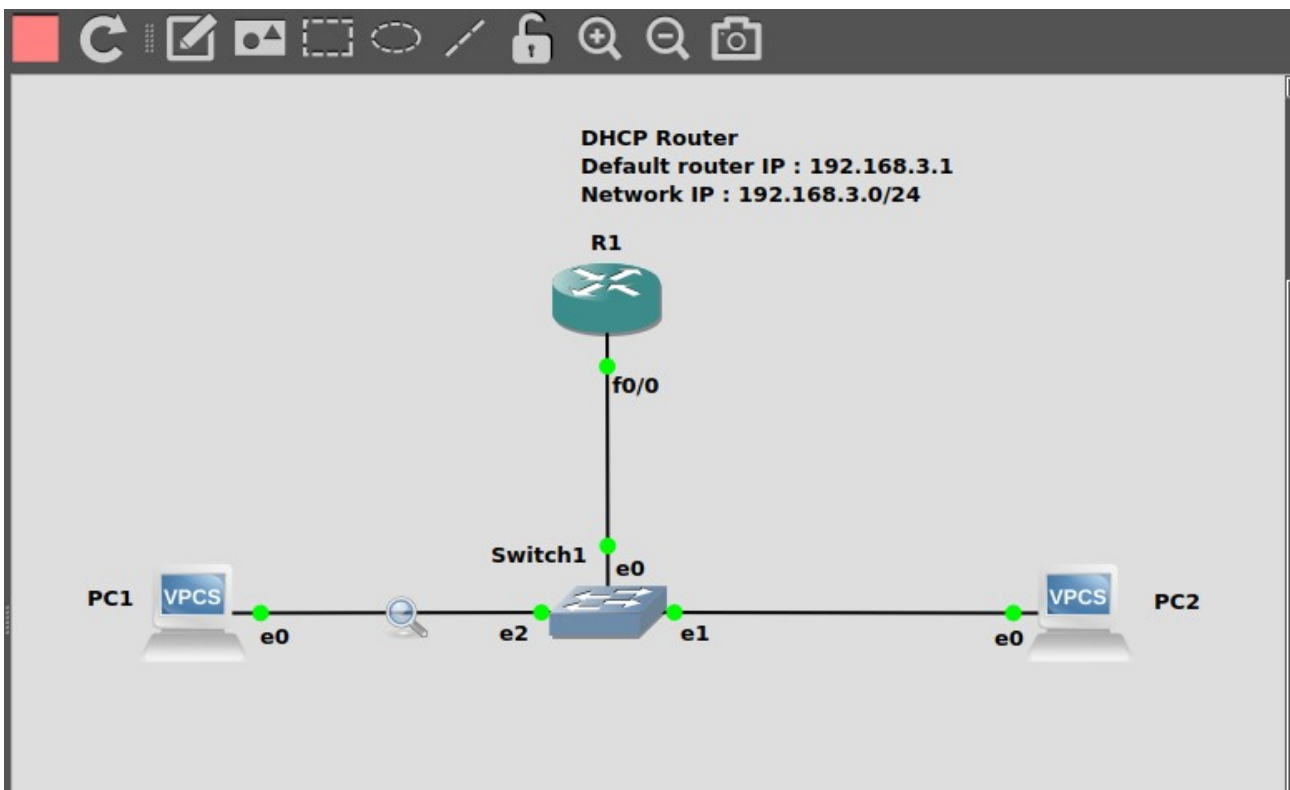
No.	Time	Source	Destination	Protocol	Length	Info
24	7.098468	ca:03:11:03:00:00	Broadcast	ARP	60	Gratuitous ARP for 10.0.10.4 (Reply) (duplicate use of 10.0.10.4 detected!)
25	7.817251	ca:04:11:12:00:00	Broadcast	ARP	60	Gratuitous ARP for 10.0.10.4 (Reply) (duplicate use of 10.0.10.4 detected!)
26	8.100152	ca:03:11:03:00:00	Broadcast	ARP	60	Gratuitous ARP for 10.0.10.4 (Reply) (duplicate use of 10.0.10.4 detected!)
27	8.827945	ca:04:11:12:00:00	Broadcast	ARP	60	Gratuitous ARP for 10.0.10.4 (Reply) (duplicate use of 10.0.10.4 detected!)
28	8.838028	ca:03:11:03:00:00	Broadcast	ARP	60	Gratuitous ARP for 10.0.10.4 (Reply) (duplicate use of 10.0.10.4 detected!)
29	8.848225	ca:04:11:12:00:00	Broadcast	ARP	60	Gratuitous ARP for 10.0.10.4 (Reply) (duplicate use of 10.0.10.4 detected!)
30	9.039923	ca:03:11:03:00:00	Broadcast	ARP	60	Gratuitous ARP for 10.0.10.4 (Reply) (duplicate use of 10.0.10.4 detected!)
31	9.545591	ca:01:10:d1:00:00	ca:01:10:d1:00:00	LOOP	60	Reply
32	9.758425	ca:04:11:12:00:00	Broadcast	ARP	60	Gratuitous ARP for 10.0.10.4 (Reply) (duplicate use of 10.0.10.4 detected!)
33	10.041988	ca:03:11:03:00:00	Broadcast	ARP	60	Gratuitous ARP for 10.0.10.4 (Reply) (duplicate use of 10.0.10.4 detected!)
34	10.740605	ca:04:11:12:00:00	Broadcast	ARP	60	Gratuitous ARP for 10.0.10.4 (Reply) (duplicate use of 10.0.10.4 detected!)
35	11.023911	ca:03:11:03:00:00	Broadcast	ARP	60	Gratuitous ARP for 10.0.10.4 (Reply) (duplicate use of 10.0.10.4 detected!)
36	11.034115	ca:04:11:12:00:00	Broadcast	ARP	60	Gratuitous ARP for 10.0.10.4 (Reply) (duplicate use of 10.0.10.4 detected!)
37	11.044208	ca:03:11:03:00:00	Broadcast	ARP	60	Gratuitous ARP for 10.0.10.4 (Reply) (duplicate use of 10.0.10.4 detected!)

Frame 31: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0
Ethernet II, Src: ca:01:10:d1:00:00 (ca:01:10:d1:00:00), Dst: ca:01:10:d1:00:00 (ca:01:10:d1:00:00)
Destination: ca:01:10:d1:00:00 (ca:01:10:d1:00:00)
Address: ca:01:10:d1:00:00 (ca:01:10:d1:00:00)
...1... = LG bit: Locally administered address (this is NOT the factory default)
...0... = IG bit: Individual address (unicast)
Source: ca:01:10:d1:00:00 (ca:01:10:d1:00:00)
Address: ca:01:10:d1:00:00 (ca:01:10:d1:00:00)
...1... = LG bit: Locally administered address (this is NOT the factory default)
...0... = IG bit: Individual address (unicast)
Type: Loopback (0x9000)
Configuration Test Protocol (loopback)
skipCount: 0
Relevant function: Reply (1)

0000 ca 01 10 d1 00 00 ca 01 10 d1 00 00 90 00 00 00
0010 01 00 00 00 00 00 00 00 00 00 00 00 00
0020 00 00 00 00 00 00 00 00 00 00 00 00 00
0030 00 00 00 00 00 00 00 00 00 00 00 00 00

wireshark_-_20211106144758_8n4dnz.pcapng Packets: 75 - Displayed: 75 (100.0%) - Dropped: 0 (0.0%) Profile: Default

LAB EXERCISE



Router 1 configuration :

```
R1#
R1#config 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)#exit
R1(config)#int f0/0
R1(config-if)#no sh
R1(config-if)#
*Mar  1 00:02:31.795: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed s
tate to up
*Mar  1 00:02:32.795: %LINEPROTO-5-UPDOWN: Line protocol on Interface Fast
Ethernet0/0, changed state to up
R1(config-if)#ip address 192.168.3.1 255.255.255.0
R1(config-if)#no sh
R1(config-if)#exit
R1(config)#exit
R1#
*Mar  1 00:03:06.367: %SYS-5-CONFIG_I: Configured from console by console
R1#sh ip
% Incomplete command.

R1#sh 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 r
oute
       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#
```

PC1 configuration :

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

PC1> sh ip

NAME          : PC1[1]
IP/MASK        : 192.168.3.2/24
GATEWAY        : 192.168.3.1
DNS            :
DHCP SERVER    : 192.168.3.1
DHCP LEASE     : 84153, 86400/43200/75600
MAC            : 00:50:79:66:68:00
LPORT          : 10008
RHOST:PORT     : 127.0.0.1:10009
MTU            : 1500

PC1> 
```

PC2 configuration :

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

PC2> sh ip

NAME          : PC2[1]
IP/MASK        : 192.168.3.3/24
GATEWAY        : 192.168.3.1
DNS            :
DHCP SERVER    : 192.168.3.1
DHCP LEASE     : 84209, 86400/43200/75600
MAC            : 00:50:79:66:68:01
LPORT          : 10010
RHOST:PORT     : 127.0.0.1:10011
MTU            : 1500

PC2> 
```

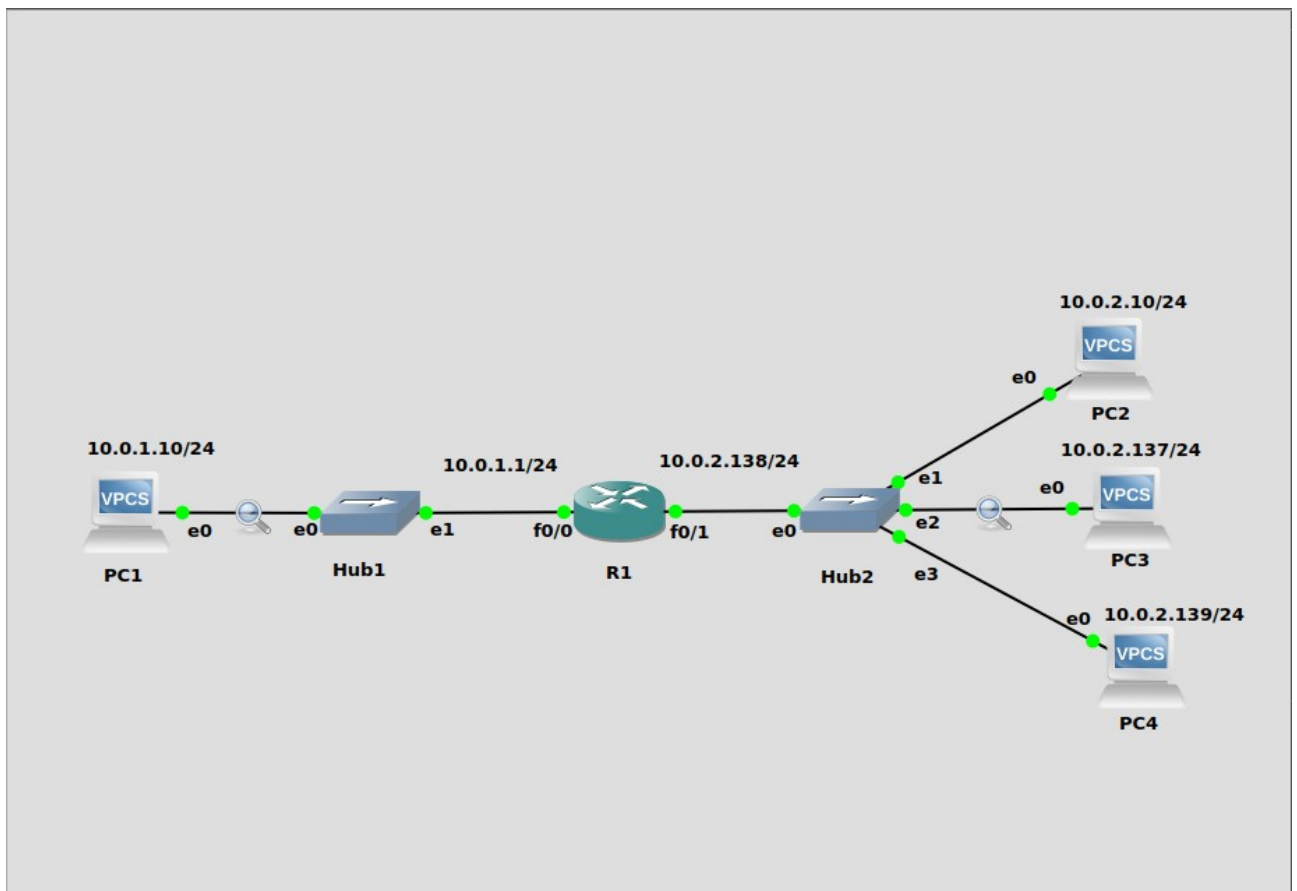

Capturing By Wireshark :

The image shows a Wireshark network traffic capture. The top pane displays a list of captured packets. The selected packet is a CDP (Cisco Discovery Protocol) packet from source c4:01:14:22:00:00 to destination 01:00:0c:cc:cc:cc. The packet details pane shows the following information:

- Frame 1: 350 bytes on wire (2800 bits), 350 bytes captured (2800 bits) on interface -, id 0
- IEEE 802.3 Ethernet
 - Destination: CDP/VTP/DTP/PagP/UDLD (01:00:0c:cc:cc:cc)
 - Source: c4:01:14:22:00:00 (c4:01:14:22:00:00)
 - Length: 336
- Logical-Link Control
- Cisco Discovery Protocol
 - Version: 2
 - TTL: 180 seconds
 - Checksum: 0x3424 [correct]
 - [Checksum Status: Good]
 - Device ID: R1
 - Software Version

The packet bytes pane shows the raw data of the CDP packet, including the magic number 0xaaccd5 and the device name R1.

LAB EXERCISE :



Router 1 configuration :

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int f0/0
R1(config-if)#ip address 10.0.1.1 255.255.255.0
R1(config-if)#no sh
R1(config-if)#exit
R1(config)#
*Mar  1 00:01:39.447: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar  1 00:01:40.447: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0
, changed state to up
R1(config)#int f0/1
R1(config-if)#ip address 10.0.2.138 255.255.255.0
R1(config-if)#no sh
R1(config-if)#exit
*Mar  1 00:02:13.387: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar  1 00:02:14.387: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1
, changed state to up
R1(config-if)#exit
R1(config)#exit
R1#
```

```
R1(config)#
*Mar  1 00:01:39.447: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar  1 00:01:40.447: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0
, changed state to up
R1(config)#int f0/1
R1(config-if)#ip address 10.0.2.138 255.255.255.0
R1(config-if)#no sh
R1(config-if)#exit
*Mar  1 00:02:13.387: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar  1 00:02:14.387: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1
, changed state to up
R1(config-if)#exit
R1(config)#exit
R1#
*Mar  1 00:02:18.207: %SYS-5-CONFIG_I: Configured from console by console
R1#sh 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

    10.0.0.0/24 is subnetted, 2 subnets
C       10.0.2.0 is directly connected, FastEthernet0/1
C       10.0.1.0 is directly connected, FastEthernet0/0
R1#
```

PC1 configuration :

```
PC1> ip 10.0.1.10/24 10.0.1.1
Checking for duplicate address...
PC1 : 10.0.1.10 255.255.255.0 gateway 10.0.1.1
```

```
PC1> sh ip
```

```
NAME       : PC1[1]
IP/MASK     : 10.0.1.10/24
GATEWAY     : 10.0.1.1
DNS         :
MAC         : 00:50:79:66:68:00
LPORT      : 10016
RHOST:PORT  : 127.0.0.1:10017
MTU         : 1500
```

```
PC1> ping 10.0.2.10
```

```
10.0.2.10 icmp_seq=1 timeout
84 bytes from 10.0.2.10 icmp_seq=2 ttl=63 time=15.040 ms
84 bytes from 10.0.2.10 icmp_seq=3 ttl=63 time=12.210 ms
84 bytes from 10.0.2.10 icmp_seq=4 ttl=63 time=13.746 ms
84 bytes from 10.0.2.10 icmp_seq=5 ttl=63 time=13.185 ms
```

```
PC1> ping 10.0.2.137
```

```
10.0.2.137 icmp_seq=1 timeout
84 bytes from 10.0.2.137 icmp_seq=2 ttl=63 time=13.039 ms
84 bytes from 10.0.2.137 icmp_seq=3 ttl=63 time=12.637 ms
84 bytes from 10.0.2.137 icmp_seq=4 ttl=63 time=12.642 ms
84 bytes from 10.0.2.137 icmp_seq=5 ttl=63 time=12.398 ms
```

```
PC1> ping 10.0.2.139
```

```
10.0.2.139 icmp seq=1 timeout
```

```
PC1> ping 10.0.2.139
```

```
10.0.2.139 icmp_seq=1 timeout
84 bytes from 10.0.2.139 icmp_seq=2 ttl=63 time=18.567 ms
84 bytes from 10.0.2.139 icmp_seq=3 ttl=63 time=14.354 ms
84 bytes from 10.0.2.139 icmp_seq=4 ttl=63 time=12.960 ms
84 bytes from 10.0.2.139 icmp_seq=5 ttl=63 time=14.743 ms
```

```
PC1> 
```

Capturing By Wireshark :ON PC1 and ON PC3

Wireshark packet capture interface showing a loopback packet on interface FastEthernet0/0. The packet list shows a single packet (No. 7) with a time of 52.259883, source and destination MAC addresses of c4:01:1e:43:00:00, and a protocol of LOOP. The packet length is 60 bytes. The packet details pane shows the Ethernet II frame structure, including the destination and source MAC addresses, and the loopback type. The packet data pane shows the raw bytes of the packet.

No.	Time	Source	Destination	Protocol	Length	Info
7	52.259883	c4:01:1e:43:00:00	c4:01:1e:43:00:00	LOOP	60	Reply

Capture Length: 60 bytes (480 bits)
[Frame is marked: False]
[Frame is ignored: False]
[Protocols in frame: eth:ethertype:loop:data]
Ethernet II, Src: c4:01:1e:43:00:00 (c4:01:1e:43:00:00), Dst: c4:01:1e:43:00:00 (c4:01:1e:43:00:00)
Destination: c4:01:1e:43:00:00 (c4:01:1e:43:00:00)
Address: c4:01:1e:43:00:00 (c4:01:1e:43:00:00)
... .. = LG bit: Globally unique address (factory default)
... .. = IG bit: Individual address (unicast)
Source: c4:01:1e:43:00:00 (c4:01:1e:43:00:00)
Type: Loopback (0x0000)
Configuration Test Protocol (loopback)
Data (40 bytes)

Ready to load or capture

Packets: 15 - Displayed: 15 (100.0%) Profile: Default

Wireshark packet capture interface showing a CDP packet on interface FastEthernet0/1. The packet list shows a single packet (No. 218) with a time of 1377.433, source and destination MAC addresses of c4:01:1e:43:00:01, and a protocol of CDP. The packet length is 359 bytes. The packet details pane shows the IEEE 802.3 Ethernet frame structure, including the destination and source MAC addresses, and the CDP packet structure. The packet data pane shows the raw bytes of the packet.

No.	Time	Source	Destination	Protocol	Length	Info
218	1377.433	c4:01:1e:43:00:01	c4:01:1e:43:00:01	CDP/VTP/DTP/PAgP/UDLD CDP	359	Device ID: R1 Port ID: FastEthernet0/1

Frame 1: 359 bytes on wire (2872 bits), 359 bytes captured (2872 bits) on interface -, id 0
IEEE 802.3 Ethernet
Logical-Link Control
DSAP: SNAP (0xaa)
SSAP: SNAP (0xaa)
Control field: U, func=UI (0x03)
Organization Code: 00:00:0c (Cisco Systems, Inc)
PID: CDP (0x2000)
Cisco Discovery Protocol

Ready to load or capture

Packets: 226 - Displayed: 226 (100.0%) Profile: Default

PC2 configuration :

```
PC2> ip 10.0.2.10/24 10.0.2.138
Checking for duplicate address...
PC2 : 10.0.2.10 255.255.255.0 gateway 10.0.2.138

PC2> sh ip

NAME       : PC2[1]
IP/MASK     : 10.0.2.10/24
GATEWAY     : 10.0.2.138
DNS         :
MAC         : 00:50:79:66:68:01
LPORT      : 10018
RHOST:PORT  : 127.0.0.1:10019
MTU         : 1500

PC2>
```

```
PC2> ping 10.0.1.10

84 bytes from 10.0.1.10 icmp_seq=1 ttl=63 time=30.224 ms
84 bytes from 10.0.1.10 icmp_seq=2 ttl=63 time=12.159 ms
84 bytes from 10.0.1.10 icmp_seq=3 ttl=63 time=12.351 ms
84 bytes from 10.0.1.10 icmp_seq=4 ttl=63 time=11.856 ms
84 bytes from 10.0.1.10 icmp_seq=5 ttl=63 time=12.291 ms

PC2>
```

The image shows a Wireshark packet capture window. The top menu bar includes File, Edit, View, Go, Capture, Analyze, Statistics, Telephony, Wireless, Tools, and Help. Below the menu is a toolbar with various icons. The main window displays a list of captured packets. The first packet is selected, showing its details in the packet list pane. The packet is a CDP (Cisco Discovery Protocol) packet from PC2 (10.0.2.10) to R1 (10.0.1.10). The packet details pane shows the following information:

- Frame 1: 350 bytes on wire (2800 bits), 350 bytes captured (2800 bits) on interface -, id 0
- IEEE 802.3 Ethernet
 - Destination: CDP/VTP/DTP/PAGP/UDLD (01:00:0c:cc:cc:cc)
 - Source: c4:01:14:22:00:00 (c4:01:14:22:00:00)
 - Length: 336
- Logical-Link Control
- Cisco Discovery Protocol
 - Version: 2
 - TTL: 180 seconds
 - Checksum: 0x3424 [correct]
 - [Checksum Status: Good]
 - Device ID: R1
 - Software Version

The packet bytes pane shows the raw data of the packet, including the Ethernet II header, LLC header, and the CDP packet body. The packet body contains the following information:

- 0000 01 00 0c cc cc c4 01 14 22 00 00 01 50 aa baP..
- 0010 03 00 00 0c 20 00 02 b4 34 24 00 01 00 06 52 314\$...R1
- 0020 00 05 00 fb 43 69 73 63 6f 20 49 4f 53 20 53 6fCisco IOS So
- 0030 66 74 77 61 72 65 2c 20 33 37 30 30 20 53 6f 66 ftware, 3700 Sof
- 0040 74 77 61 72 65 20 28 43 33 37 34 35 2d 41 44 56 tware (C 3745-ADV
- 0050 49 50 53 45 52 56 49 43 45 53 4b 39 2d 4d 29 2c IPSERVIC ESK9-M),
- 0060 20 56 65 72 73 69 6f 6e 20 31 32 2e 34 28 32 35 Version 12.4(25
- 0070 64 29 2c 20 52 45 4c 45 41 53 45 20 53 4f 46 54 d), RELE ASE SOFT
- 0080 57 41 52 45 20 28 66 63 31 29 0a 54 65 63 68 6e WARE (fc 1) Techn
- 0090 69 63 61 6c 20 53 75 70 70 6f 72 74 3a 20 68 74 ical Sup port: ht
- 00a0 74 70 3a 2f 2f 77 77 2e 63 69 73 63 6f 2e 63 tp://www .cisco.c

The bottom status bar shows "Ready to load or capture", "Packets: 8 - Displayed: 8 (100.0%)", and "Profile: Default". The system clock at the bottom right shows "Sat Nov 6 5:13:39 PM".

PC3 configuration :

```
PC3> sh ip
```

```
NAME       : PC3[1]
IP/MASK    : 0.0.0.0/0
GATEWAY    : 0.0.0.0
DNS        :
MAC        : 00:50:79:66:68:02
LPORT      : 10020
RHOST:PORT : 127.0.0.1:10021
MTU        : 1500
```

```
PC3> sh ip
```

```
NAME       : PC3[1]
IP/MASK    : 10.0.2.137/24
GATEWAY    : 10.0.2.138
DNS        :
MAC        : 00:50:79:66:68:02
LPORT      : 10020
RHOST:PORT : 127.0.0.1:10021
MTU        : 1500
```

```
PC3> ping 10.0.2.139
```

```
84 bytes from 10.0.2.139 icmp_seq=1 ttl=64 time=0.671 ms
84 bytes from 10.0.2.139 icmp_seq=2 ttl=64 time=0.883 ms
84 bytes from 10.0.2.139 icmp_seq=3 ttl=64 time=1.074 ms
84 bytes from 10.0.2.139 icmp_seq=4 ttl=64 time=1.127 ms
84 bytes from 10.0.2.139 icmp_seq=5 ttl=64 time=1.219 ms
```

```
PC3> wr
```

```
Saving startup configuration to startup.vpc
. done
```

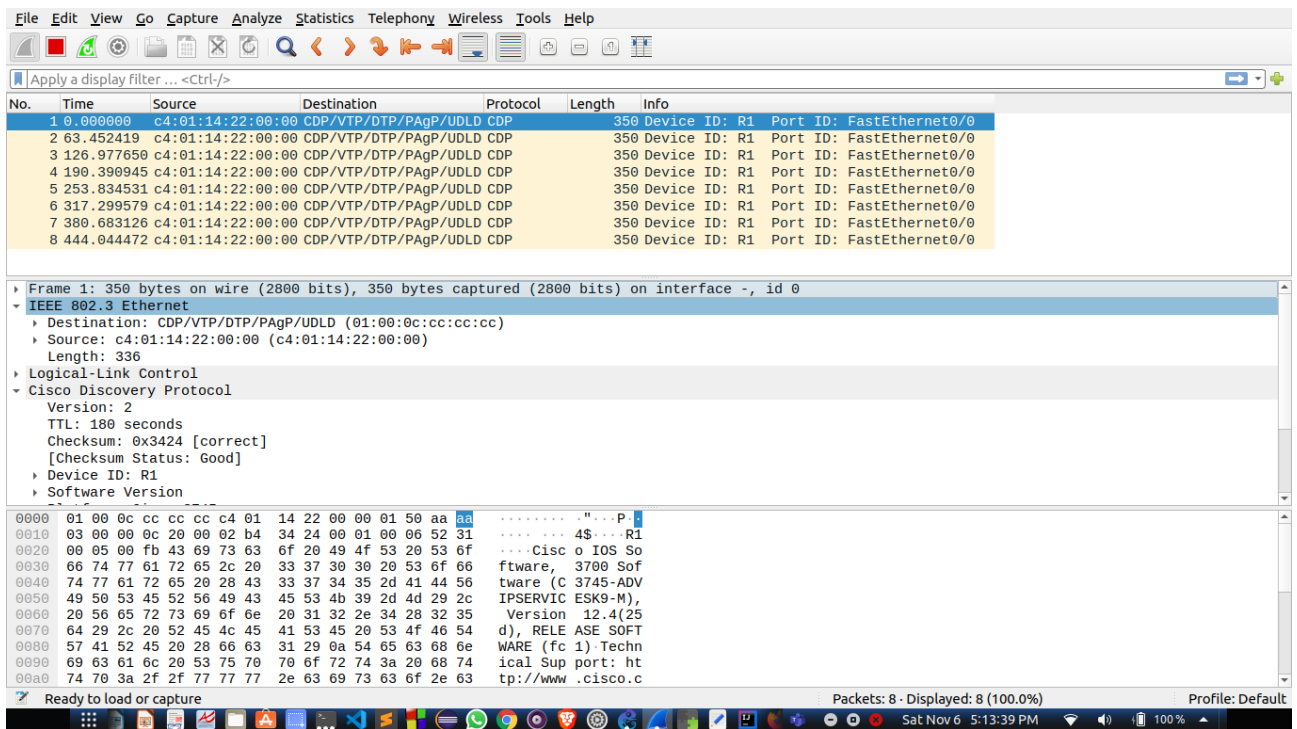
```
PC3> ping 10.0.2.10
```

```
84 bytes from 10.0.2.10 icmp_seq=1 ttl=64 time=0.618 ms
```

```
PC3> ping 10.0.2.10
```

```
84 bytes from 10.0.2.10 icmp_seq=1 ttl=64 time=0.618 ms
84 bytes from 10.0.2.10 icmp_seq=2 ttl=64 time=0.891 ms
84 bytes from 10.0.2.10 icmp_seq=3 ttl=64 time=0.953 ms
84 bytes from 10.0.2.10 icmp_seq=4 ttl=64 time=1.343 ms
84 bytes from 10.0.2.10 icmp_seq=5 ttl=64 time=0.722 ms
```

```
PC3> 
```

PC4 configuration :

```

MTU : 1500

PC4> ip 10.0.2.139/24 10.0.2.138
Checking for duplicate address...
PC4 : 10.0.2.139 255.255.255.0 gateway 10.0.2.138

PC4> sh ip

NAME : PC4[1]
IP/MASK : 10.0.2.139/24
GATEWAY : 10.0.2.138
DNS :
MAC : 00:50:79:66:68:03
LPORT : 10022
RHOST:PORT : 127.0.0.1:10023
MTU : 1500

PC4>

```

```

PC4> ping 10.0.1.10

84 bytes from 10.0.1.10 icmp_seq=1 ttl=63 time=30.418 ms
84 bytes from 10.0.1.10 icmp_seq=2 ttl=63 time=21.087 ms
84 bytes from 10.0.1.10 icmp_seq=3 ttl=63 time=13.835 ms
84 bytes from 10.0.1.10 icmp_seq=4 ttl=63 time=13.817 ms
84 bytes from 10.0.1.10 icmp_seq=5 ttl=63 time=13.035 ms

PC4> ping 10.0.2.10

84 bytes from 10.0.2.10 icmp_seq=1 ttl=64 time=0.893 ms
84 bytes from 10.0.2.10 icmp_seq=2 ttl=64 time=1.411 ms
84 bytes from 10.0.2.10 icmp_seq=3 ttl=64 time=0.821 ms
84 bytes from 10.0.2.10 icmp_seq=4 ttl=64 time=1.086 ms
84 bytes from 10.0.2.10 icmp_seq=5 ttl=64 time=0.920 ms

PC4>

```

