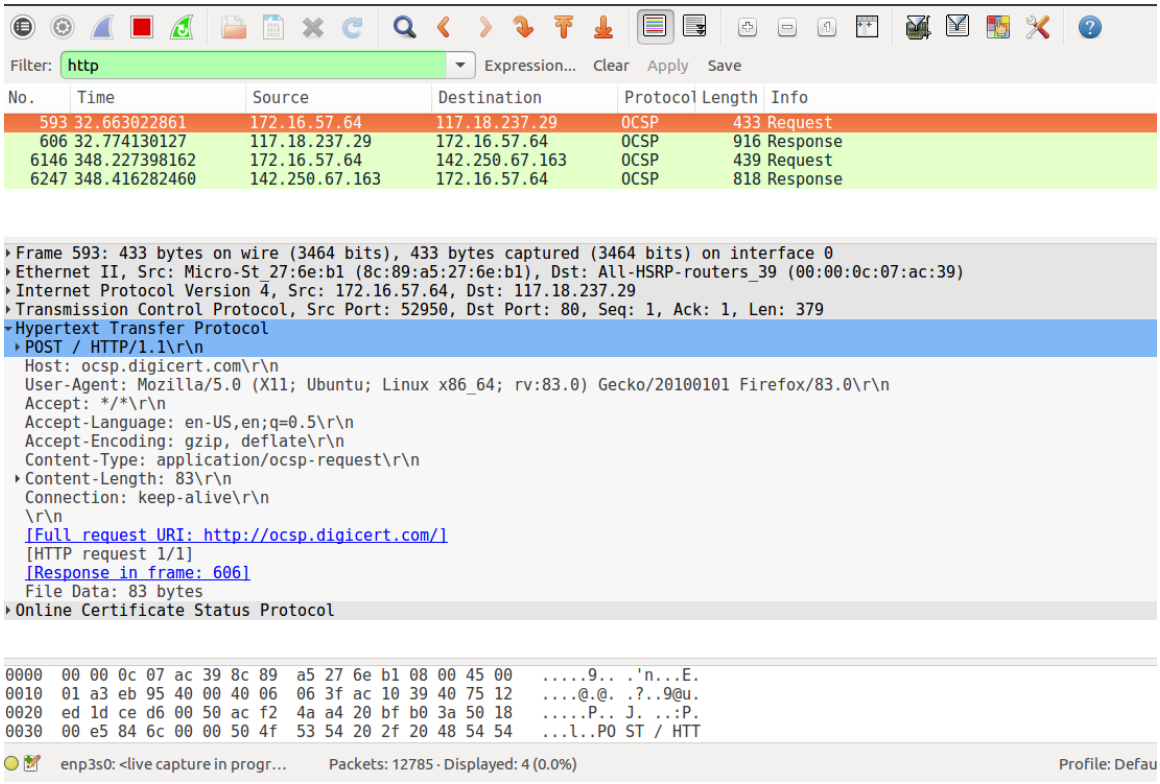
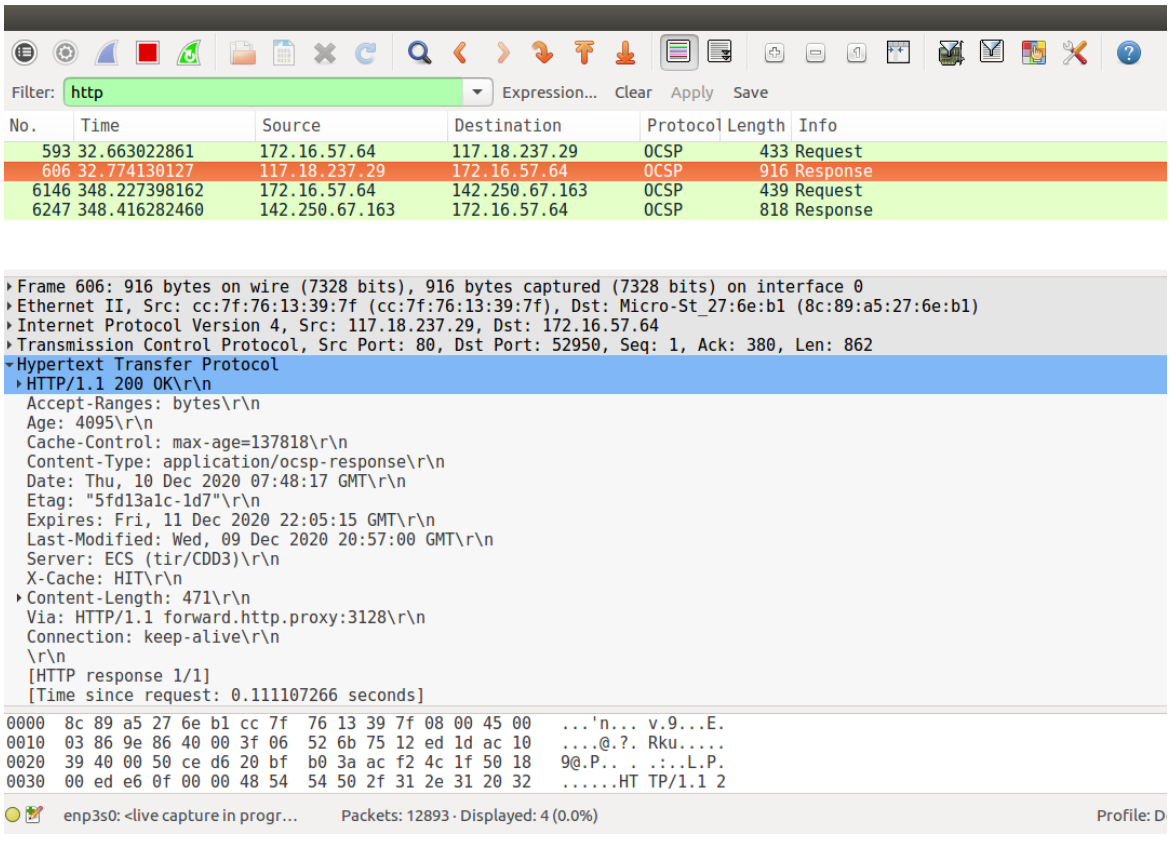
Name: Kaustav Ghosh
Reg no: 180905188
Section: CSE – C
Roll no 29

Q3.1
Request

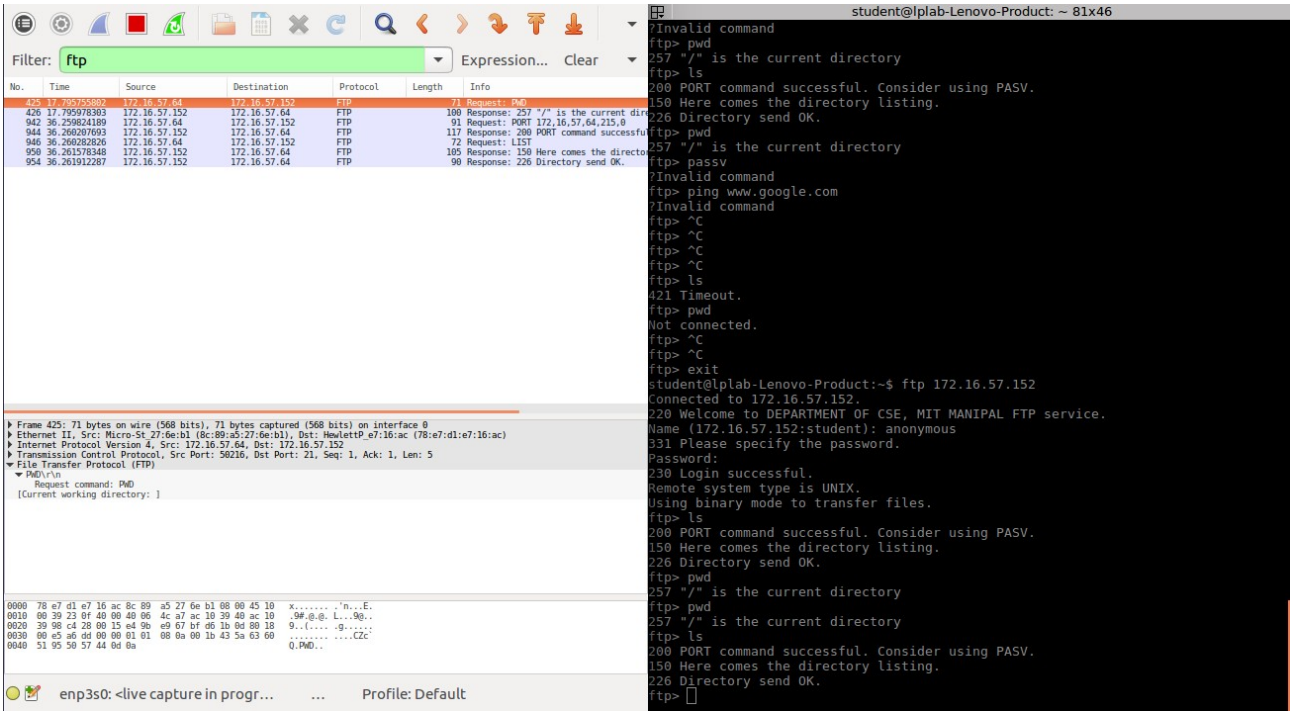


Response

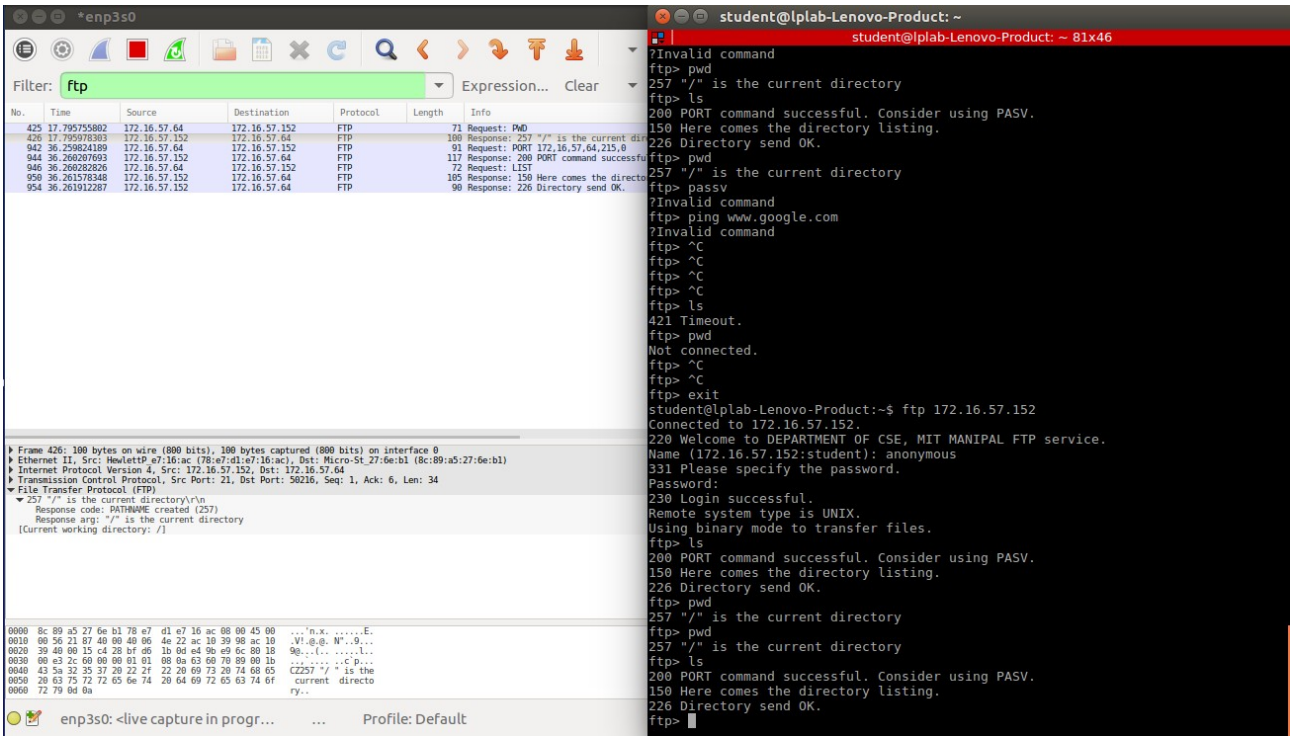


Q3.2

request

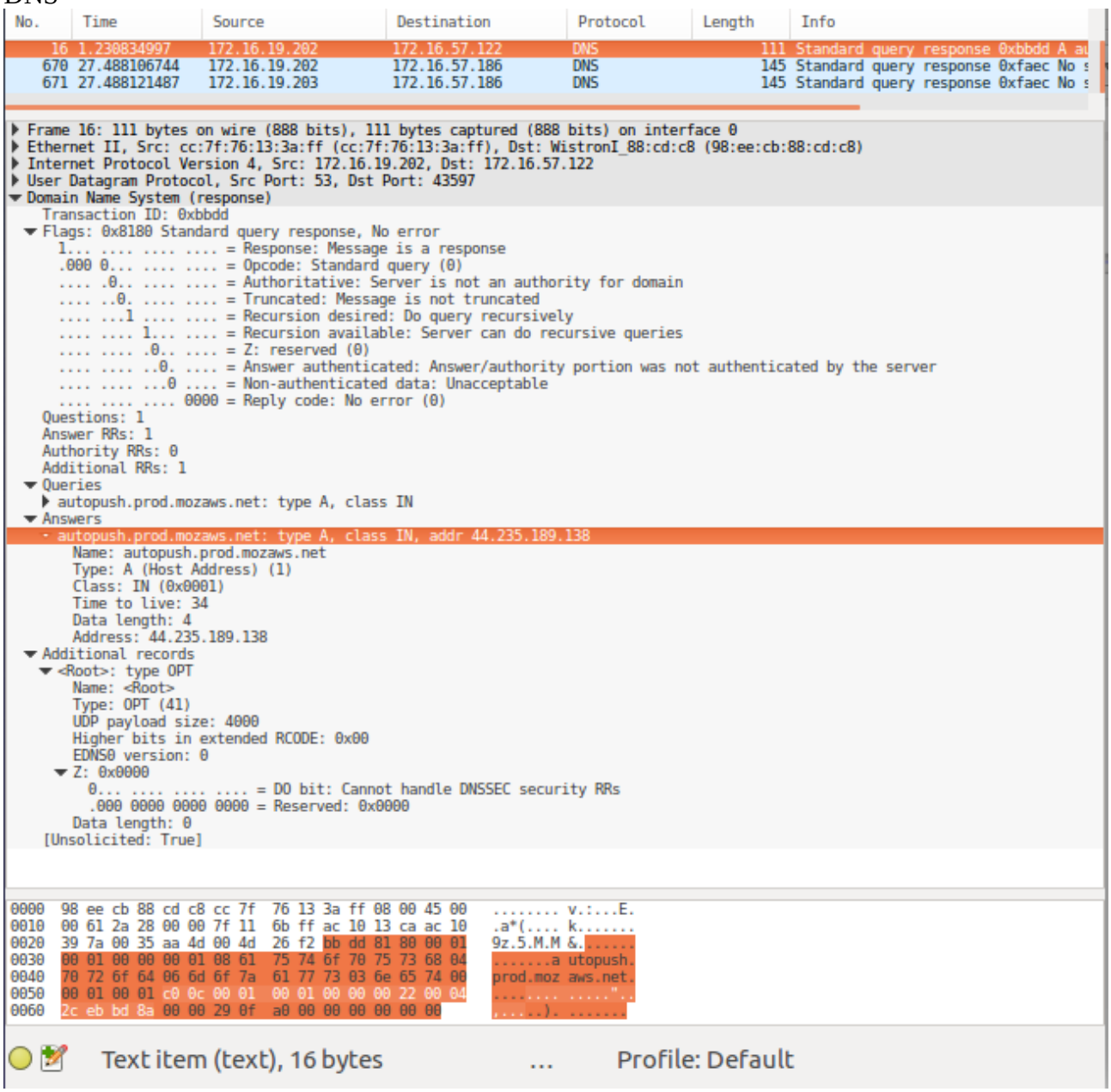


Response



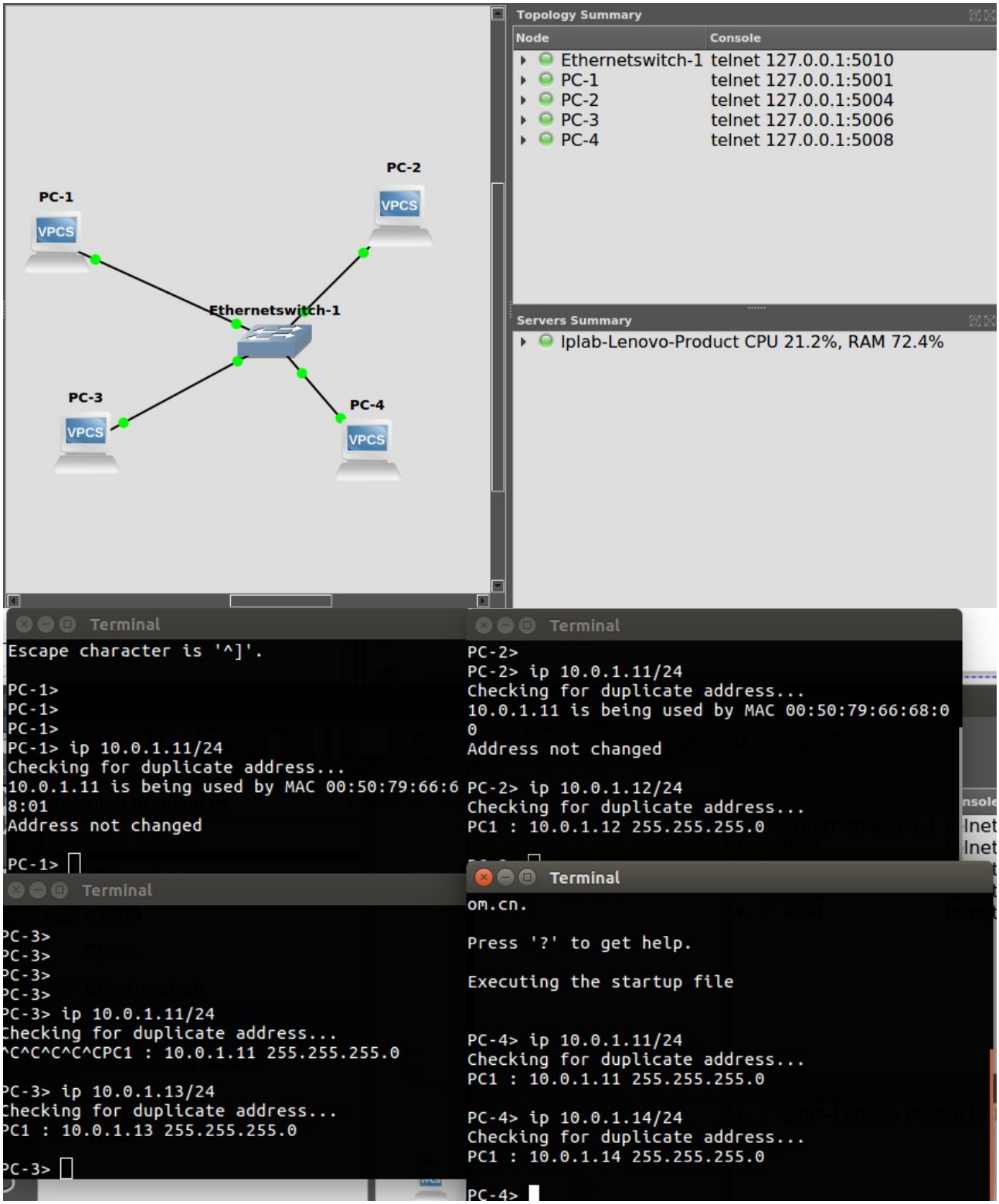
Q 3.7

DNS


No. Time Source Destination Protocol Length Info
16 1.230834997 172.16.19.202 172.16.57.122 DNS 111 Standard query response 0xbbdd A au
670 27.488106744 172.16.19.202 172.16.57.186 DNS 145 Standard query response 0xfaec No s
671 27.488121487 172.16.19.203 172.16.57.186 DNS 145 Standard query response 0xfaec No s
Frame 16: 111 bytes on wire (888 bits), 111 bytes captured (888 bits) on interface 0
Ethernet II, Src: cc:7f:76:13:3a:ff (cc:7f:76:13:3a:ff), Dst: WistronI_88:cd:c8 (98:ee:cb:88:cd:c8)
Internet Protocol Version 4, Src: 172.16.19.202, Dst: 172.16.57.122
User Datagram Protocol, Src Port: 53, Dst Port: 43597
Domain Name System (response)
Transaction ID: 0xbbdd
Flags: 0x8180 Standard query response, No error
1... .... = Response: Message is a response
.000 0... .... = Opcode: Standard query (0)
.... .0.. .... = Authoritative: Server is not an authority for domain
.... ..0. .... = Truncated: Message is not truncated
....1 .... = Recursion desired: Do query recursively
.... 1... .... = Recursion available: Server can do recursive queries
.... .0.. .... = Z: reserved (0)
....0. .... = Answer authenticated: Answer/authority portion was not authenticated by the server
....0 .... = Non-authenticated data: Unacceptable
.... 0000 = Reply code: No error (0)
Questions: 1
Answer RRs: 1
Authority RRs: 0
Additional RRs: 1
Queries
autopush.prod.mozaws.net: type A, class IN
Answers
autopush.prod.mozaws.net: type A, class IN, addr 44.235.189.138
Name: autopush.prod.mozaws.net
Type: A (Host Address) (1)
Class: IN (0x0001)
Time to live: 34
Data length: 4
Address: 44.235.189.138
Additional records
<Root>: type OPT
Name: <Root>
Type: OPT (41)
UDP payload size: 4000
Higher bits in extended RCODE: 0x00
EDNS0 version: 0
Z: 0x0000
0... .... = DO bit: Cannot handle DNSSEC security RRs
.000 0000 0000 0000 = Reserved: 0x0000
Data length: 0
[Unsolicited: True]
0000 98 ee cb 88 cd c8 cc 7f 76 13 3a ff 08 00 45 00 .... v.:...E.
0010 00 61 2a 28 00 00 7f 11 6b ff ac 10 13 ca ac 10 .a*(.... k.......
0020 39 7a 00 35 aa 4d 00 4d 26 f2 bb dd 81 80 00 01 9z.5.M.M &.......
0030 00 01 00 00 00 01 08 61 75 74 6f 70 75 73 68 04 ....a utopush.
0040 70 72 6f 64 06 6d 6f 7a 61 77 73 03 6e 65 74 00 prod.moz aws.net.
0050 00 01 00 01 c0 0c 00 01 00 01 00 00 00 22 00 04 ....".
0060 2c eb bd 8a 00 00 29 0f a0 00 00 00 00 00 00 ,.....). ....
Text item (text), 16 bytes
...
Profile: Default

Q 4.1

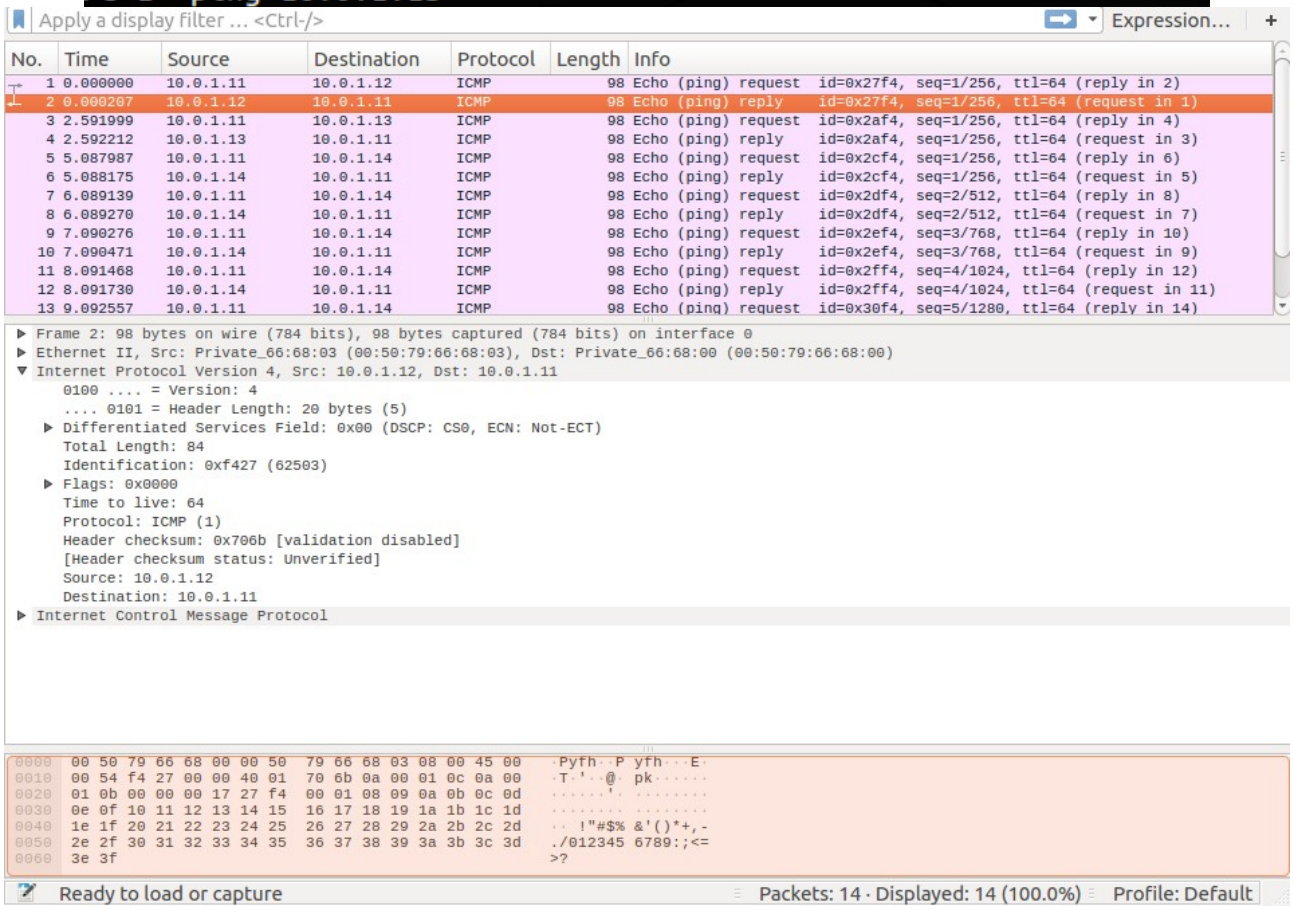
4.1a


Topology Summary
Node
Console
Ethernetswitch-1 telnet 127.0.0.1:5010
PC-1 telnet 127.0.0.1:5001
PC-2 telnet 127.0.0.1:5004
PC-3 telnet 127.0.0.1:5006
PC-4 telnet 127.0.0.1:5008
Servers Summary
lplab-Lenovo-Product CPU 21.2%, RAM 72.4%
PC-1
PC-2
PC-3
PC-4
Ethernetswitch-1
VPCS
Terminal
Escape character is '^]'.
PC-1>
PC-1> ip 10.0.1.11/24
Checking for duplicate address...
10.0.1.11 is being used by MAC 00:50:79:66:68:01
Address not changed
PC-2>
PC-2> ip 10.0.1.11/24
Checking for duplicate address...
10.0.1.11 is being used by MAC 00:50:79:66:68:00
Address not changed
PC-2> ip 10.0.1.12/24
Checking for duplicate address...
PC1 : 10.0.1.12 255.255.255.0
PC-3>
PC-3> ip 10.0.1.11/24
Checking for duplicate address...
PC1 : 10.0.1.11 255.255.255.0
PC-3> ip 10.0.1.13/24
Checking for duplicate address...
PC1 : 10.0.1.13 255.255.255.0
Press '?' to get help.
Executing the startup file
PC-4> ip 10.0.1.11/24
Checking for duplicate address...
PC1 : 10.0.1.11 255.255.255.0
PC-4> ip 10.0.1.14/24
Checking for duplicate address...
PC1 : 10.0.1.14 255.255.255.0

4.1 a

4.1b

```
PC-1> ping 10.0.1.12
84 bytes from 10.0.1.12 icmp_seq=1 ttl=64 time=0.258 ms
^[[A^C
PC-1> ping 10.0.1.13
```



4.1 c

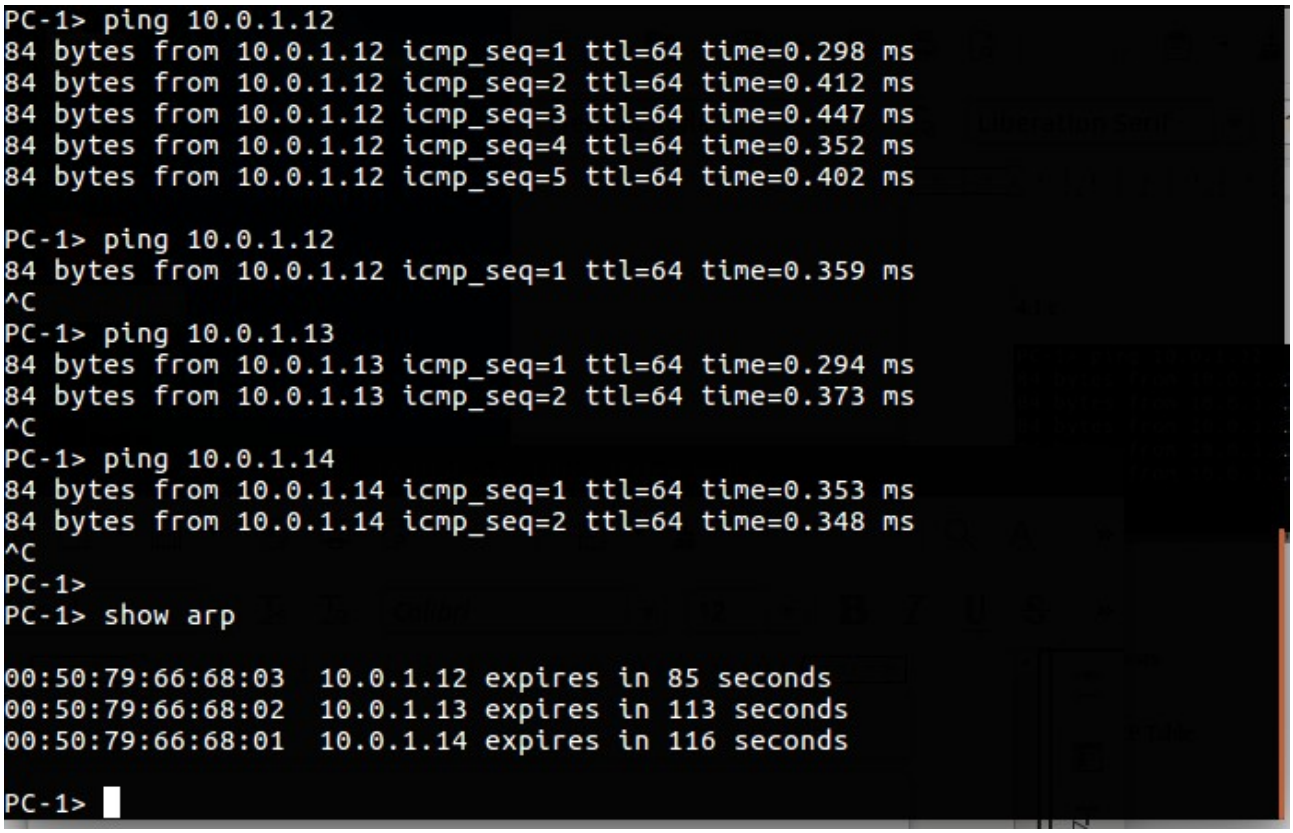
```
PC-1> ping 10.0.1.12
84 bytes from 10.0.1.12 icmp_seq=1 ttl=64 time=0.298 ms
84 bytes from 10.0.1.12 icmp_seq=2 ttl=64 time=0.412 ms
84 bytes from 10.0.1.12 icmp_seq=3 ttl=64 time=0.447 ms
84 bytes from 10.0.1.12 icmp_seq=4 ttl=64 time=0.352 ms
84 bytes from 10.0.1.12 icmp_seq=5 ttl=64 time=0.402 ms

PC-1>
```

4.1d

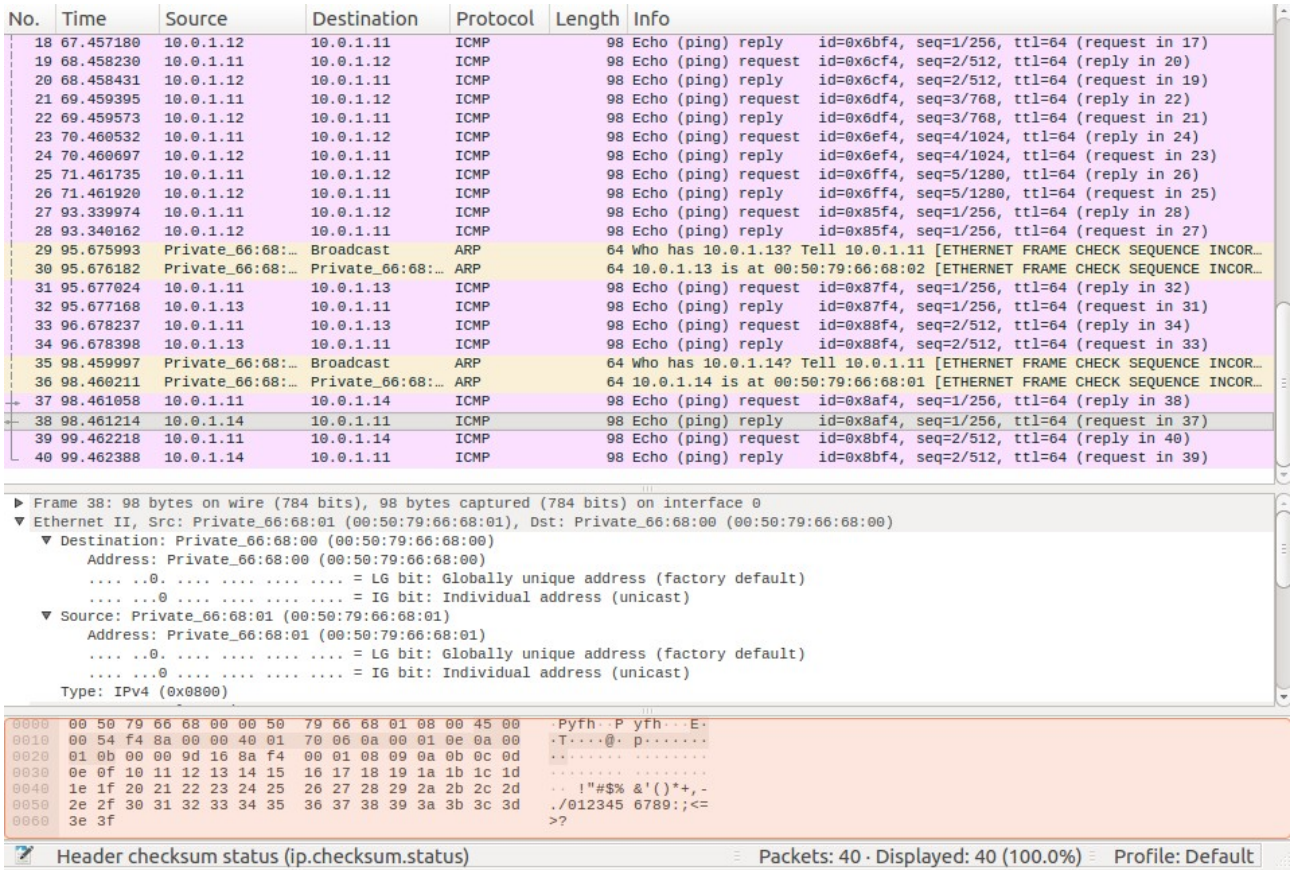
MAC Addresses

```
▼ Ethernet II, Src: Private_66:68:01 (00:50:79:66:68:01), Dst: Private_66:68:00 (00:50:79:66:68:00)
    ▼ Destination: Private_66:68:00 (00:50:79:66:68:00)
        Address: Private_66:68:00 (00:50:79:66:68:00)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    ▼ Source: Private_66:68:01 (00:50:79:66:68:01)
        Address: Private_66:68:01 (00:50:79:66:68:01)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
      Type: IPv4 (0x0800)
```

Showing ARP Table



4.1e



Exercises

1. What is the destination MAC address of an ARP Request packet?

Ans: It is the MAC address of the device to which the ARP Request packet is being sent

For example: Destination: Private_66:68:01 (00:50:79:66:68:01) for 10.0.0.4

2. What are the different Type Field values in the Ethernet headers that you observed?

Ans:

Ethernet II, Src: Private_66:68:02 (00:50:79:66:68:02), Dst: Private_66:68:00 (00:50:79:66:68:00)

Destination: Private_66:68:00 (00:50:79:66:68:00)

Address: Private_66:68:00 (00:50:79:66:68:00)

.... ..0. .... = LG bit: Globally unique address (factory default)

....0 .... = IG bit: Individual address (unicast)

Source: Private_66:68:02 (00:50:79:66:68:02)

Address: Private_66:68:02 (00:50:79:66:68:02)

.... ..0. .... = LG bit: Globally unique address (factory default)

....0 .... = IG bit: Individual address (unicast)

Type: IPv4 (0x0800)

3. Use the captured data to analyse the process in which ARP acquires the MAC

address for IP address10.0.1.12.

Ans: MAC Address: Private_66:68:03 (00:50:79:66:68:03)

4. Use your output data and ping results to explain what happened in each of the ping

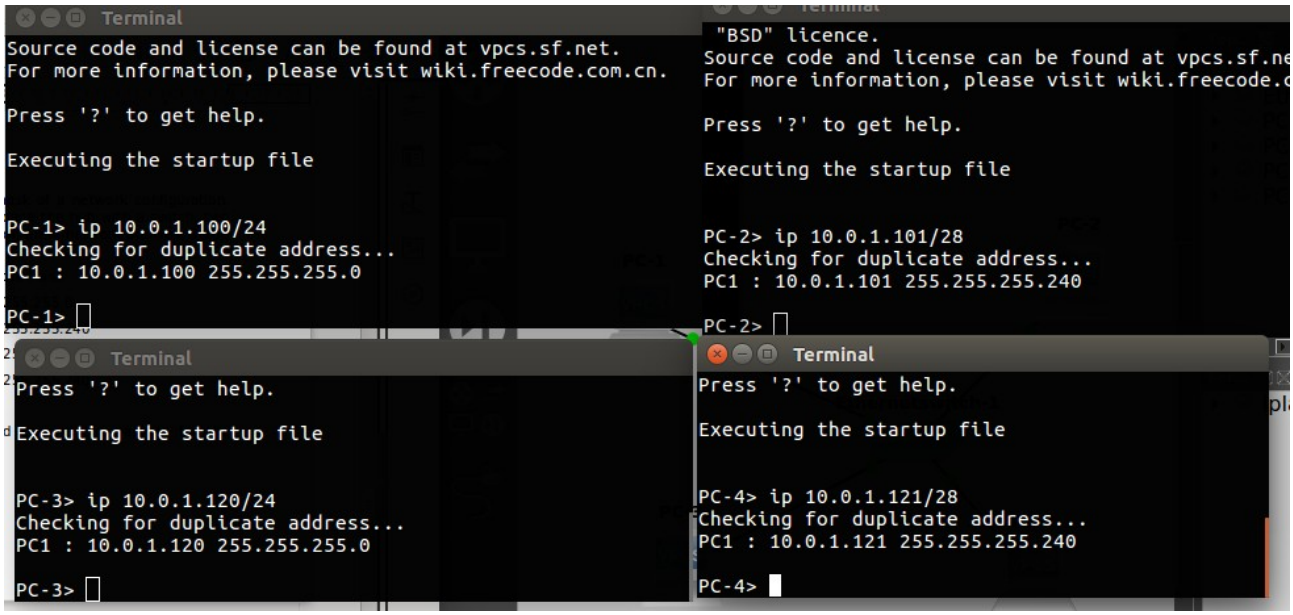
commands.

Ans: When the pings were made to other devices , those devices showed up in the ARP table of the source computer

5. Which ping operations were successful, and which were unsuccessful? Why?

Ans: All pings wer successful.

Q 4.2



4.2a

4.2b

```
PC-1> ping 10.0.1.120
84 bytes from 10.0.1.120 icmp_seq=1 ttl=64 time=0.255 ms
84 bytes from 10.0.1.120 icmp_seq=2 ttl=64 time=0.338 ms
```

4.2 c

```
PC-1> ping 10.0.1.101
84 bytes from 10.0.1.101 icmp_seq=1 ttl=64 time=0.235 ms
84 bytes from 10.0.1.101 icmp_seq=2 ttl=64 time=0.415 ms
84 bytes from 10.0.1.101 icmp_seq=3 ttl=64 time=0.323 ms
84 bytes from 10.0.1.101 icmp_seq=4 ttl=64 time=0.350 ms
84 bytes from                                  e=0.348 ms
```

```
PC-1> ping 10.0.1.121
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
```

4.2d

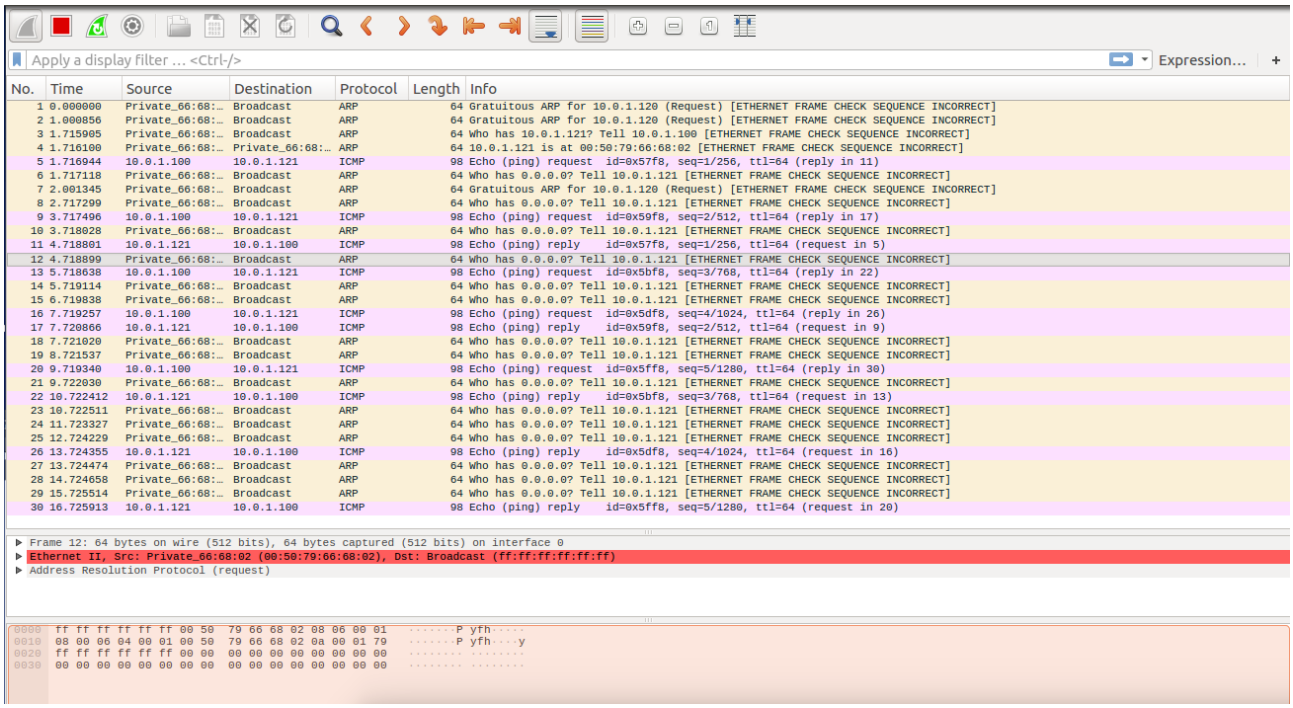
```
PC-4> ping 10.0.1.100
No gateway found
```

4.2e

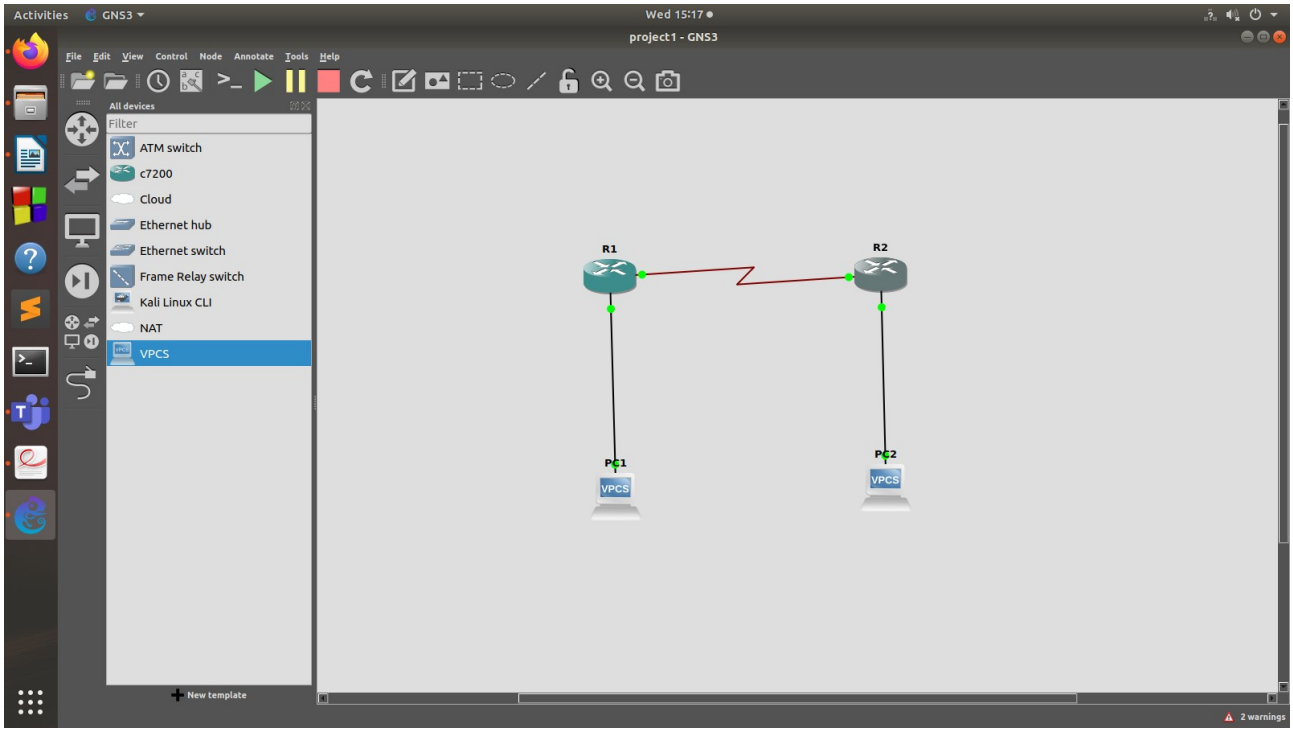
```
PC-2> ping 10.0.1.121
No gateway found
```

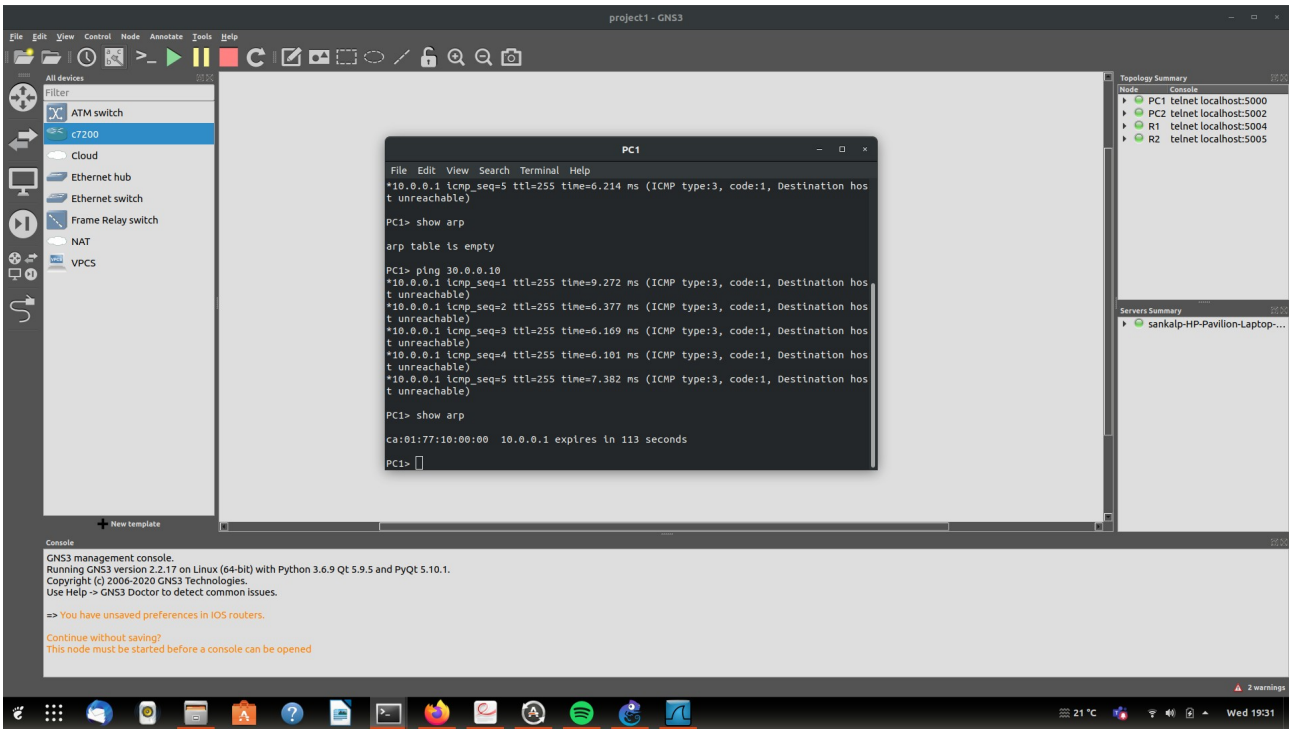
4.2f

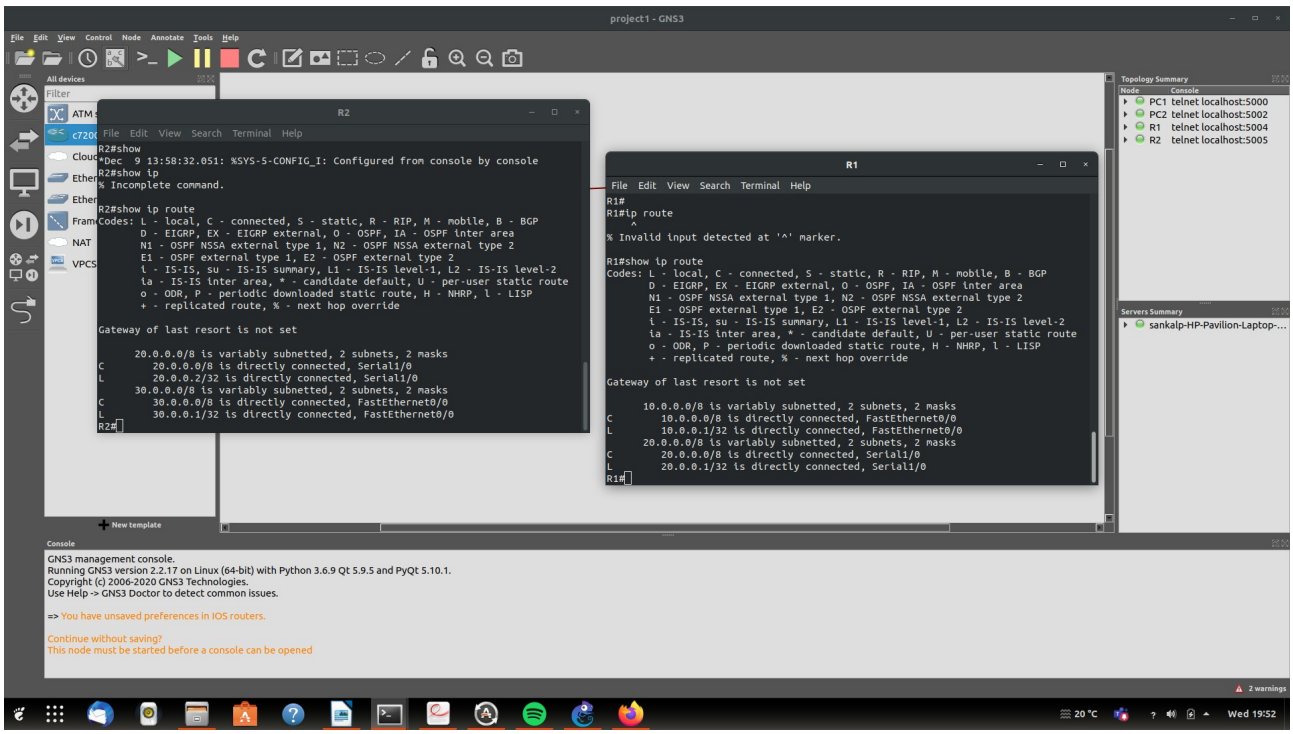
```
PC-2> ping 10.0.1.120
No gateway found
```



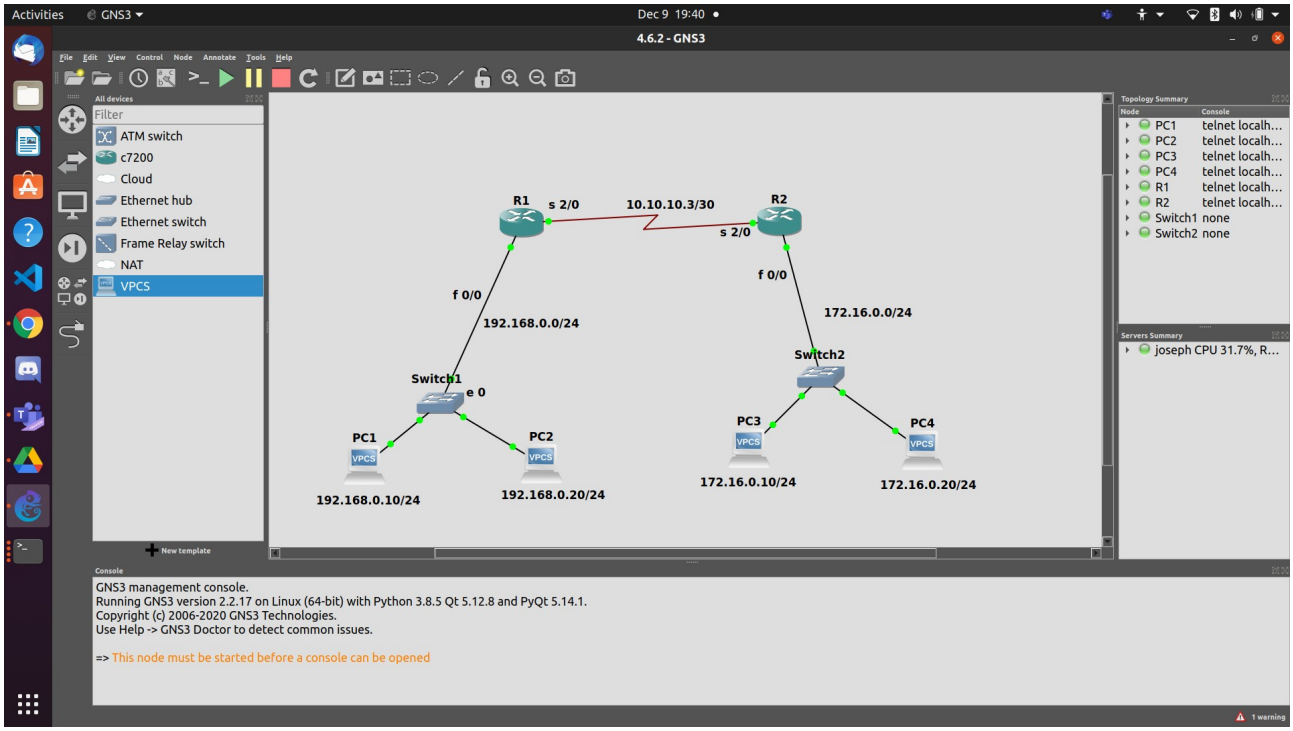
4.6) a)

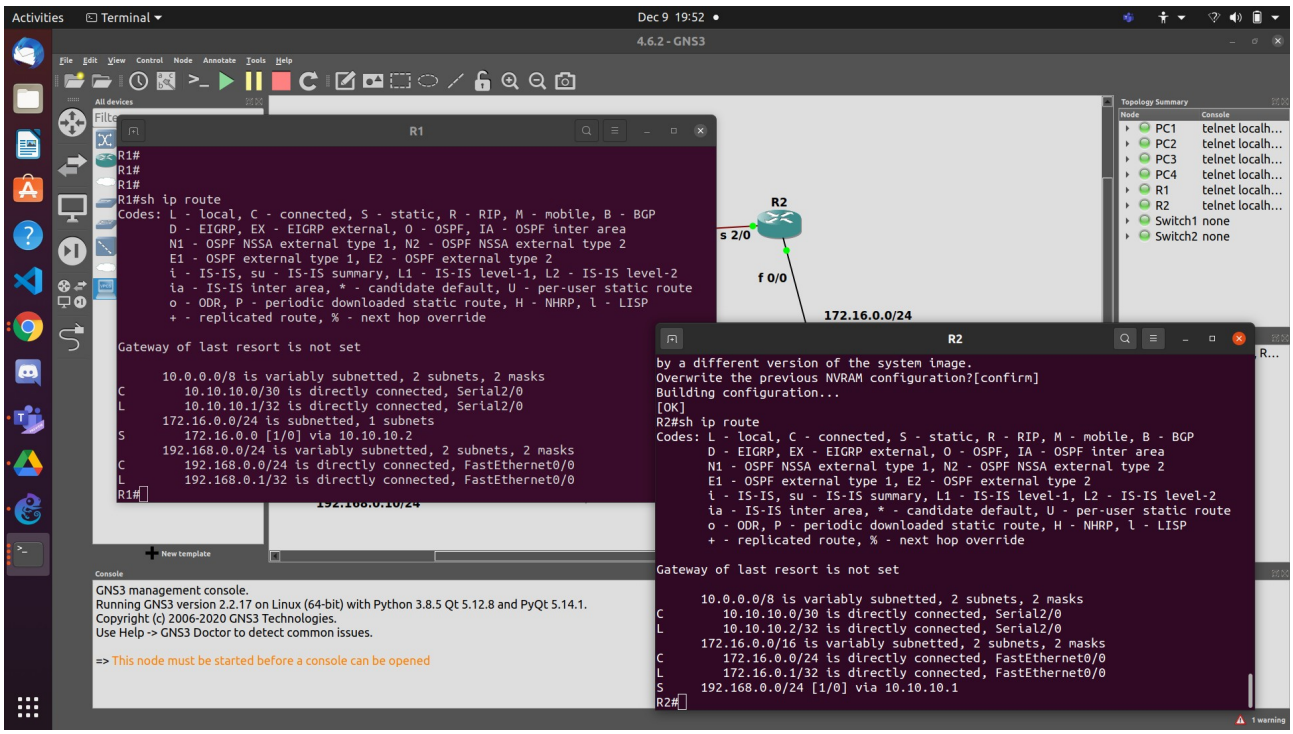

Activities
GNS3
Wed 15:17
project1 - GNS3
File Edit View Control Node Annotate Tools Help
All devices
Filter
ATM switch
c7200
Cloud
Ethernet hub
Ethernet switch
Frame Relay switch
Kali Linux CLI
NAT
VPCS
New template
R1
R2
PC1
PC2
VPCS
VPCS
2 warnings


project1 - GNS3
File Edit View Control Node Annotate Tools Help
All devices
Filter
ATM switch
c7200
Cloud
Ethernet hub
Ethernet switch
Frame Relay switch
NAT
VPCS
New template
PC1
File Edit View Search Terminal Help
*10.0.0.1 icmp_seq=5 ttl=255 time=6.214 ms (ICMP type:3, code:1, Destination hos
t unreachable)
PC1> show arp
arp table is empty
PC1> ping 30.0.0.10
*10.0.0.1 icmp_seq=1 ttl=255 time=9.272 ms (ICMP type:3, code:1, Destination hos
t unreachable)
*10.0.0.1 icmp_seq=2 ttl=255 time=6.377 ms (ICMP type:3, code:1, Destination hos
t unreachable)
*10.0.0.1 icmp_seq=3 ttl=255 time=6.169 ms (ICMP type:3, code:1, Destination hos
t unreachable)
*10.0.0.1 icmp_seq=4 ttl=255 time=6.101 ms (ICMP type:3, code:1, Destination hos
t unreachable)
*10.0.0.1 icmp_seq=5 ttl=255 time=7.382 ms (ICMP type:3, code:1, Destination hos
t unreachable)
PC1> show arp
ca:01:77:10:00:00 10.0.0.1 expires in 113 seconds
PC1>
Topology Summary
Node Console
PC1 telnet localhost:5000
PC2 telnet localhost:5002
R1 telnet localhost:5004
R2 telnet localhost:5005
Servers Summary
sankalp-HP-Pavilion-Laptop-...
Console
GNS3 management console.
Running GNS3 version 2.2.17 on Linux (64-bit) with Python 3.6.9 Qt 5.9.5 and PyQt 5.10.1.
Copyright (c) 2006-2020 GNS3 Technologies.
Use Help -> GNS3 Doctor to detect common issues.
=> You have unsaved preferences in IOS routers.
Continue without saving?
This node must be started before a console can be opened
2 warnings
21 °C
Wed 19:31


project1 - GNS3
R2
R2#show
*Dec 9 13:58:32.051: %SYS-5-CONFIG_I: Configured from console by console
R2#show ip
% Incomplete command.
R2#show ip route
Codes: L - local, 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, H - NHRP, l - LISP
+ - replicated route, % - next hop override
Gateway of last resort is not set
20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 20.0.0.0/8 is directly connected, Serial1/0
L 20.0.0.2/32 is directly connected, Serial1/0
30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 30.0.0.0/8 is directly connected, FastEthernet0/0
L 30.0.0.1/32 is directly connected, FastEthernet0/0
R1
R1#
R1#ip route
% Invalid input detected at '^' marker.
R1#show ip route
Codes: L - local, 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, H - NHRP, l - LISP
+ - replicated route, % - next hop override
Gateway of last resort is not set
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 10.0.0.0/8 is directly connected, FastEthernet0/0
L 10.0.0.1/32 is directly connected, FastEthernet0/0
20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 20.0.0.0/8 is directly connected, Serial1/0
L 20.0.0.1/32 is directly connected, Serial1/0
Topology Summary
PC1 telnet localhost:5000
PC2 telnet localhost:5002
R1 telnet localhost:5004
R2 telnet localhost:5005
Console
GNS3 management console.
Running GNS3 version 2.2.17 on Linux (64-bit) with Python 3.6.9 Qt 5.9.5 and PyQt 5.10.1.
Copyright (c) 2006-2020 GNS3 Technologies.
Use Help -> GNS3 Doctor to detect common issues.
=> You have unsaved preferences in IOS routers.
Continue without saving?
This node must be started before a console can be opened

b)


Activities
GNS3
Dec 9 19:40
4.6.2 - GNS3
ATM switch
c7200
Cloud
Ethernet hub
Ethernet switch
Frame Relay switch
NAT
VPCS
R1
s 2/0
10.10.10.3/30
R2
s 2/0
f 0/0
192.168.0.0/24
f 0/0
172.16.0.0/24
Switch1
e 0
Switch2
PC1
PC2
PC3
PC4
192.168.0.10/24
192.168.0.20/24
172.16.0.10/24
172.16.0.20/24
Topology Summary
PC1 telnet localh...
PC2 telnet localh...
PC3 telnet localh...
PC4 telnet localh...
R1 telnet localh...
R2 telnet localh...
Switch1 none
Switch2 none
Servers Summary
joseph CPU 31.7%, R...
Console
GNS3 management console.
Running GNS3 version 2.2.17 on Linux (64-bit) with Python 3.8.5 Qt 5.12.8 and PyQt 5.14.1.
Copyright (c) 2006-2020 GNS3 Technologies.
Use Help -> GNS3 Doctor to detect common issues.
=> This node must be started before a console can be opened


Activities
Terminal
Dec 9 19:52
4.6.2 - GNS3
R1
R1#
R1#
R1#
R1#sh ip route
Codes: L - local, 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, H - NHRP, l - LISP
+ - replicated route, % - next hop override
Gateway of last resort is not set
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 10.10.10.0/30 is directly connected, Serial2/0
L 10.10.10.1/32 is directly connected, Serial2/0
172.16.0.0/24 is subnetted, 1 subnets
S 172.16.0.0 [1/0] via 10.10.10.2
192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.0.0/24 is directly connected, FastEthernet0/0
L 192.168.0.1/32 is directly connected, FastEthernet0/0
R1#
R2
s 2/0
f 0/0
172.16.0.0/24
R2
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...
[OK]
R2#sh ip route
Codes: L - local, 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, H - NHRP, l - LISP
+ - replicated route, % - next hop override
Gateway of last resort is not set
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 10.10.10.0/30 is directly connected, Serial2/0
L 10.10.10.2/32 is directly connected, Serial2/0
172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 172.16.0.0/24 is directly connected, FastEthernet0/0
L 172.16.0.1/32 is directly connected, FastEthernet0/0
S 192.168.0.0/24 [1/0] via 10.10.10.1
R2#
Topology Summary
Node Console
PC1 telnet localh...
PC2 telnet localh...
PC3 telnet localh...
PC4 telnet localh...
R1 telnet localh...
R2 telnet localh...
Switch1 none
Switch2 none
New template
Console
GNS3 management console.
Running GNS3 version 2.2.17 on Linux (64-bit) with Python 3.8.5 Qt 5.12.8 and PyQt 5.14.1.
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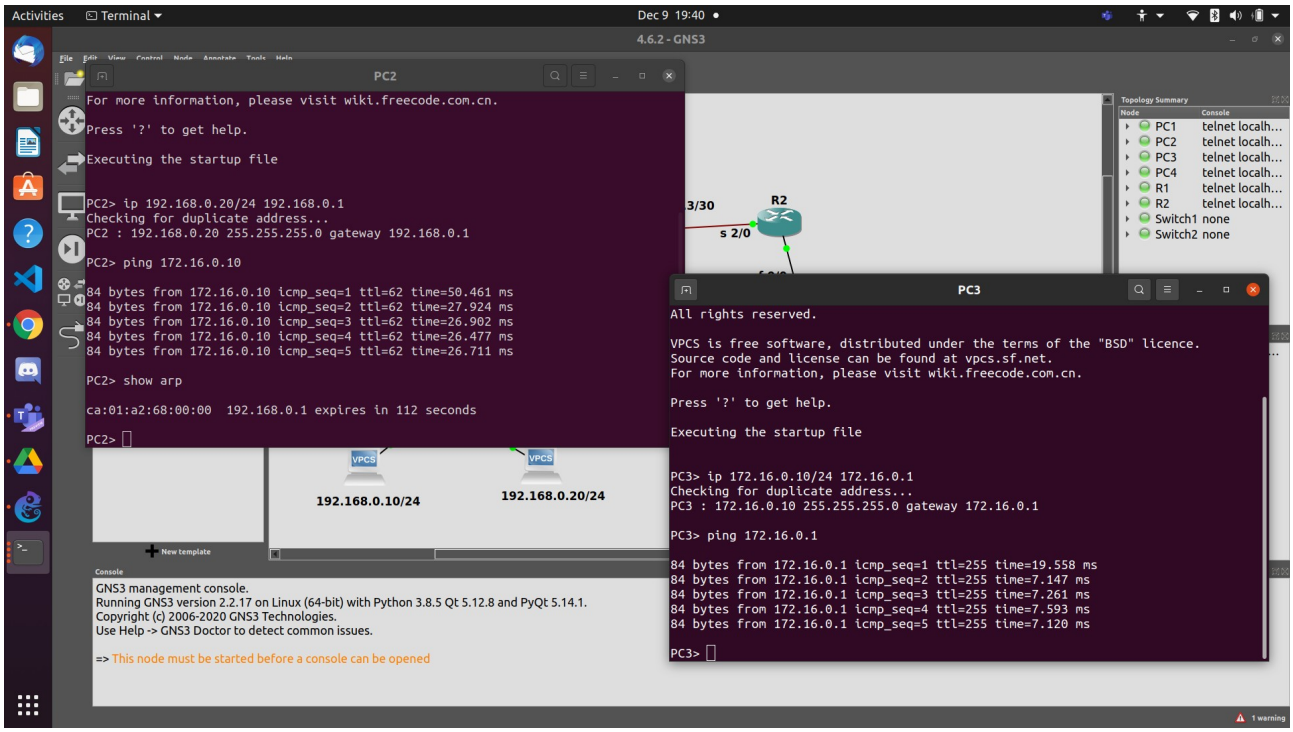
Use Help -> GNS3 Doctor to detect common issues.
=> This node must be started before a console can be opened
1 warning


Activities
Terminal
Dec 9 19:40
4.6.2 - GNS3
PC2
For more information, please visit wiki.freecode.com.cn.
Press '?' to get help.
Executing the startup file
PC2> ip 192.168.0.20/24 192.168.0.1
Checking for duplicate address...
PC2 : 192.168.0.20 255.255.255.0 gateway 192.168.0.1
PC2> ping 172.16.0.10
84 bytes from 172.16.0.10 icmp_seq=1 ttl=62 time=50.461 ms
84 bytes from 172.16.0.10 icmp_seq=2 ttl=62 time=27.924 ms
84 bytes from 172.16.0.10 icmp_seq=3 ttl=62 time=26.902 ms
84 bytes from 172.16.0.10 icmp_seq=4 ttl=62 time=26.477 ms
84 bytes from 172.16.0.10 icmp_seq=5 ttl=62 time=26.711 ms
PC2> show arp
ca:01:a2:68:00:00 192.168.0.1 expires in 112 seconds
PC2>
3/30
R2
s 2/0
PC3
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Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.
Press '?' to get help.
Executing the startup file
PC3> ip 172.16.0.10/24 172.16.0.1
Checking for duplicate address...
PC3 : 172.16.0.10 255.255.255.0 gateway 172.16.0.1
PC3> ping 172.16.0.1
84 bytes from 172.16.0.1 icmp_seq=1 ttl=255 time=19.558 ms
84 bytes from 172.16.0.1 icmp_seq=2 ttl=255 time=7.147 ms
84 bytes from 172.16.0.1 icmp_seq=3 ttl=255 time=7.261 ms
84 bytes from 172.16.0.1 icmp_seq=4 ttl=255 time=7.593 ms
84 bytes from 172.16.0.1 icmp_seq=5 ttl=255 time=7.120 ms
PC3>
VPCS
192.168.0.10/24
VPCS
192.168.0.20/24
Topology Summary
Node Console
PC1 telnet localh...
PC2 telnet localh...
PC3 telnet localh...
PC4 telnet localh...
R1 telnet localh...
R2 telnet localh...
Switch1 none
Switch2 none
New template
Console
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1 warning