

F29DC Lab 2

Question 1:

Configure the PCs with IP addresses 192.168.1.1 and 192.168.2.1. Is PC2 reachable from PC1?

No, it is not. The base subnet mask is /24, which means the network addresses (192.168.1 & 192.168.2) are different. Despite being connected by a router, they are on a different network. This router has not been configured to let IP addresses of separate networks communicate as of now.

Proof of Completion:

The image shows two terminal windows for VPCS (Virtual PC Simulator) and a network diagram. The left terminal window is for PC1 (localhost 5001) and the right is for PC2 (localhost 5003). Both show the VPCS startup sequence, including the version (0.8.2), build time (Aug 23 2021 03:18:07), and copyright information. PC1 has been configured with IP 192.168.1.1. PC2 has been configured with IP 192.168.2.1. The network diagram below shows PC1 and PC2 connected to a central router R1. PC1 is labeled 'VPCS' and PC2 is labeled 'VPCS'. The router R1 is a blue cylinder with a white cross on its top. The connections are represented by green dots and lines.

```
lucca — PC1 — telnet localhost 5001 — 80x24
Trying ::1...
Connected to localhost.
Escape character is '^J'.

Welcome to Virtual PC Simulator, version 0.8.2
Dedicated to Daling.
Build time: Aug 23 2021 03:18:07
Copyright (c) 2007-2015, Paul Meng (mirnshi@gmail.com)
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VPCS is free software, distributed under the terms of the "BSD" licence.
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

PC1> ip 192.168.1.1
Checking for duplicate address...
PC1 : 192.168.1.1 255.255.255.0
PC1>

lucca — PC2 — telnet localhost 5003 — 80x24
Welcome to Virtual PC Simulator, version 0.8.2
Dedicated to Daling.
Build time: Aug 23 2021 03:18:07
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Press '?' to get help.

Executing the startup file

PC2> ip 192.168.2.1
Checking for duplicate address...
PC2 : 192.168.2.1 255.255.255.0
PC2> ping 192.168.1.1
No gateway found
PC2>
```

PC1 R1 PC2

VPCS VPCS

Question 2:

Ping FE0/0 from PC1 and FE0/1 from PC2. Does it work? Why?

It does work because FE0/0 is now on the same Network as PC1 (192.168.1) and FE0/1 is now on the same Network as PC2 (192.168.2).

Proof of Completion:

The screenshot displays a Mac desktop with several open windows:

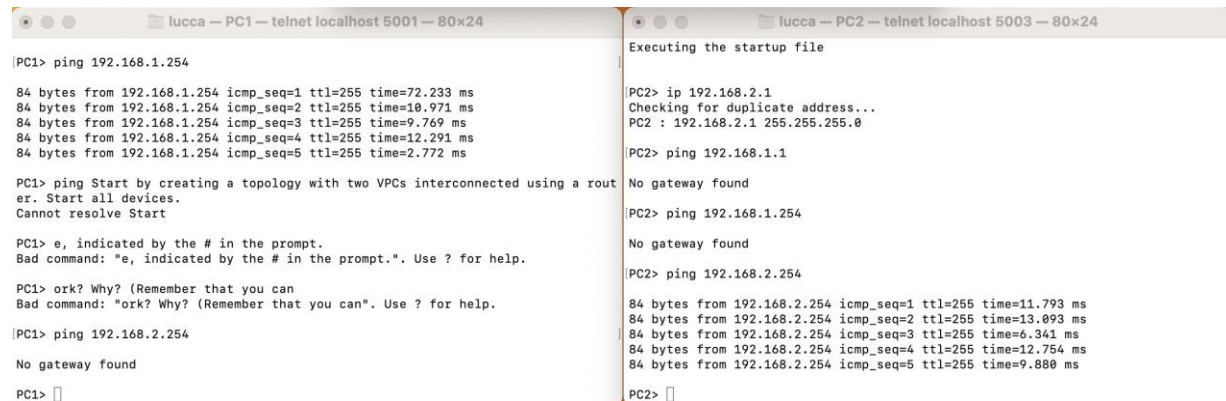
- Terminal Window (lucca — R1 — telnet localhost 5000 — 80x24):** Shows the configuration of a Cisco R1 router. The configuration includes setting IP addresses for interfaces FastEthernet0/0 (192.168.1.254) and FastEthernet0/1 (192.168.2.254), and enabling them. The router is configured with a VPCS system.
- Terminal Window (lucca — PC1 — telnet localhost 5001 — 80x24):** Shows the configuration of PC1. The IP address is set to 192.168.1.1. The terminal also shows the execution of the startup file and the results of a ping test to 192.168.1.254, which is successful.
- Terminal Window (lucca — PC2 — telnet localhost 5003 — 80x24):** Shows the configuration of PC2. The IP address is set to 192.168.2.1. The terminal also shows the execution of the startup file and the results of a ping test to 192.168.2.254, which is successful.
- Packet Capture Window (Capturing from — PC1 Ethernet0 to R1 FastEthernet0/0):** Shows a list of captured packets. The first packet is an ARP request from PC1 to R1. The second packet is an ICMP echo request from PC1 to R1. The third packet is an ICMP echo reply from R1 to PC1.
- Packet Capture Window (Capturing from — R1 FastEthernet0/1 to PC2 Ethernet0):** Shows a list of captured packets. The first packet is an ARP request from R1 to PC2. The second packet is an ICMP echo request from R1 to PC2. The third packet is an ICMP echo reply from PC2 to R1.

Question 3:

Ping FE0/1 from PC1. Does it work? Why?

It does not. Although PC1 is able to ping FE0/0 as a device on the network, FE0/0 has not been set as a gateway for PC1 yet, so it cannot communicate with other networks, even if they are on the same router.

Proof of Completion:



```
lucca — PC1 — telnet localhost 5001 — 80x24
PC1> ping 192.168.1.254
84 bytes from 192.168.1.254 icmp_seq=1 ttl=255 time=72.233 ms
84 bytes from 192.168.1.254 icmp_seq=2 ttl=255 time=10.971 ms
84 bytes from 192.168.1.254 icmp_seq=3 ttl=255 time=9.769 ms
84 bytes from 192.168.1.254 icmp_seq=4 ttl=255 time=12.291 ms
84 bytes from 192.168.1.254 icmp_seq=5 ttl=255 time=2.772 ms

PC1> ping Start by creating a topology with two VPCs interconnected using a router. Start all devices.
Cannot resolve Start

PC1> e, indicated by the # in the prompt.
Bad command: "e, indicated by the # in the prompt.". Use ? for help.

PC1> ork? Why? (Remember that you can
Bad command: "ork? Why? (Remember that you can". Use ? for help.

PC1> ping 192.168.2.254
No gateway found

PC1>

lucca — PC2 — telnet localhost 5003 — 80x24
Executing the startup file

PC2> ip 192.168.2.1
Checking for duplicate address...
PC2 : 192.168.2.1 255.255.255.0

PC2> ping 192.168.1.1
No gateway found

PC2> ping 192.168.1.254
No gateway found

PC2> ping 192.168.2.254
84 bytes from 192.168.2.254 icmp_seq=1 ttl=255 time=11.793 ms
84 bytes from 192.168.2.254 icmp_seq=2 ttl=255 time=13.093 ms
84 bytes from 192.168.2.254 icmp_seq=3 ttl=255 time=6.341 ms
84 bytes from 192.168.2.254 icmp_seq=4 ttl=255 time=12.754 ms
84 bytes from 192.168.2.254 icmp_seq=5 ttl=255 time=9.880 ms

PC2>
```

Question 4:

Ping PC2 from PC1. Does it work? Why?

It works somewhat. You can ping it, but it will not give a response, because although there is a gateway set from PC1 to PC2, there is not a gateway set from PC2 to PC1. It needs to be set both ways for it to work properly. As shown in the Wireshark photo below, PC2 tries using ICMP to respond but when it's not able to send the message back to PC1, it resorts to trying to broadcast the info for PC1 to see using the ARP protocol to no avail.

Proof of Completion:

lucca — PC1 — telnet localhost 5001 — 80x24

84 bytes from 192.168.2.1 icmp_seq=1 ttl=63 time=46.691 ms
84 bytes from 192.168.2.1 icmp_seq=2 ttl=63 time=16.795 ms
84 bytes from 192.168.2.1 icmp_seq=3 ttl=63 time=12.711 ms
84 bytes from 192.168.2.1 icmp_seq=4 ttl=63 time=16.234 ms
84 bytes from 192.168.2.1 icmp_seq=5 ttl=63 time=16.144 ms

PC1> ping 192.168.2.1

192.168.2.1 icmp_seq=1 timeout
192.168.2.1 icmp_seq=2 timeout
192.168.2.1 icmp_seq=3 timeout
192.168.2.1 icmp_seq=4 timeout
192.168.2.1 icmp_seq=5 timeout

PC1> ping 192.168.2.1

192.168.2.1 icmp_seq=1 timeout
192.168.2.1 icmp_seq=2 timeout
192.168.2.1 icmp_seq=3 timeout
192.168.2.1 icmp_seq=4 timeout
192.168.2.1 icmp_seq=5 timeout

PC1>

lucca — PC2 — telnet localhost 5003 — 80x24

84 bytes from 192.168.2.254 icmp_seq=4 ttl=255 time=12.754 ms
84 bytes from 192.168.2.254 icmp_seq=5 ttl=255 time=9.888 ms

PC2> ip 192.168.2.1 192.168.2.254/24
Checking for duplicate address...
PC2 : 192.168.2.1 255.255.255.0 gateway 192.168.2.254

PC2> ip 192.168.2.1
Checking for duplicate address...
PC2 : 192.168.2.1 255.255.255.0

PC2> ping 192.168.2.254

84 bytes from 192.168.2.254 icmp_seq=1 ttl=255 time=10.361 ms
84 bytes from 192.168.2.254 icmp_seq=2 ttl=255 time=5.958 ms
84 bytes from 192.168.2.254 icmp_seq=3 ttl=255 time=6.208 ms
84 bytes from 192.168.2.254 icmp_seq=4 ttl=255 time=11.279 ms
84 bytes from 192.168.2.254 icmp_seq=5 ttl=255 time=4.125 ms

PC2> ping 192.168.1.1

No gateway found

PC2>

Capturing from — PC1 Ethernet0 to R1 FastEthernet0/0

No.	Time	Source	Destination	Protocol	Length	Info
349	3749.979357	192.168.1.1	192.168.2.1	ICMP	98	Echo (ping) request
350	3750.993801	192.168.2.1	192.168.1.1	ICMP	98	Echo (ping) reply
351	3751.980713	192.168.1.1	192.168.2.1	ICMP	98	Echo (ping) request
352	3753.982364	192.168.1.1	192.168.2.1	ICMP	98	Echo (ping) request
353	3753.998266	192.168.2.1	192.168.1.1	ICMP	98	Echo (ping) reply
354	3755.982862	192.168.1.1	192.168.2.1	ICMP	98	Echo (ping) request
355	3757.002096	192.168.2.1	192.168.1.1	ICMP	98	Echo (ping) reply
356	3760.007082	192.168.2.1	192.168.1.1	ICMP	98	Echo (ping) reply
357	3760.981606	c0:01:18:8f:00:00	c0:01:18:8f:00:00	LOOP	60	Reply
358	3763.003854	192.168.2.1	192.168.1.1	ICMP	98	Echo (ping) request
359	3763.377592	c0:01:18:8f:00:00	CDP/VTP/DTP/PAgP/LLDP	CDP	359	Device

> Frame 301: 98 bytes on wire (784 bits), 98 byte captured (784 bits) on interface
> Ethernet II, Src: c0:01:18:8f:00:00 (c0:01:18:8f:00:00), Dst: 01:00:00:00:00:00
> Internet Protocol Version 4, Src: 192.168.2.1, Dst: 192.168.1.1
> Internet Control Message Protocol
0000 00 50 79 66 68 00 c0 01 18 8f 00 00 00 00 00 00
0010 00 54 b6 22 00 00 3f 01 41 00 00 00 00 00 00
0020 01 01 00 00 04 54 23 b6 00 00 00 00 00 00 00 00
0030 0e 0f 10 11 12 13 14 15 16 00 00 00 00 00 00
0040 1e 1f 20 21 22 23 24 25 26 00 00 00 00 00 00
0050 2e 2f 30 31 32 33 34 35 36 00 00 00 00 00 00
0060 3e 3f 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Ready to load or capture Packets: 359 · Displayed: 359 (100.0%)

Capturing from — R1 FastEthernet0/1 to PC2 Ethernet0

No.	Time	Source	Destination	Protocol	Length	Info
394	3744.202443	Private_66:68:01	Broadcast	ARP	64	Who has 0.0.0.0? T
395	3745.203474	192.168.2.1	192.168.1.1	ICMP	98	Echo (ping) reply
396	3745.203514	Private_66:68:01	Broadcast	ARP	64	Who has 0.0.0.0? T
397	3746.203627	Private_66:68:01	Broadcast	ARP	64	Who has 0.0.0.0? T
398	3747.204275	Private_66:68:01	Broadcast	ARP	64	Who has 0.0.0.0? T
399	3748.205400	192.168.2.1	192.168.1.1	ICMP	98	Echo (ping) reply
400	3748.205527	Private_66:68:01	Broadcast	ARP	64	Who has 0.0.0.0? T
401	3749.205587	Private_66:68:01	Broadcast	ARP	64	Who has 0.0.0.0? T
402	3749.214180	c0:01:18:8f:00:01	c0:01:18:8f:00:01	LOOP	60	Reply
403	3750.206107	Private_66:68:01	Broadcast	ARP	64	Who has 0.0.0.0? T
404	3751.206645	192.168.2.1	192.168.1.1	ICMP	98	Echo (ping) reply

> Frame 324: 64 bytes on wire (512 bits), 64 byte captured (512 bits) on interface
> Ethernet II, Src: Private_66:68:01 (00:50:79:66:68:01), Dst: 01:00:00:00:00:00
> Address Resolution Protocol (request)
0000 ff ff ff ff ff ff 00 50 79 66 68 01 00 00 00 00
0010 08 00 06 04 00 01 00 50 79 66 68 01 c0 00 00 00
0020 ff ff ff ff ff ff 00 00 00 00 00 00 00 00 00 00
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Ready to load or capture Packets: 404 · Displayed: 404 (100.0%) Profile: Default