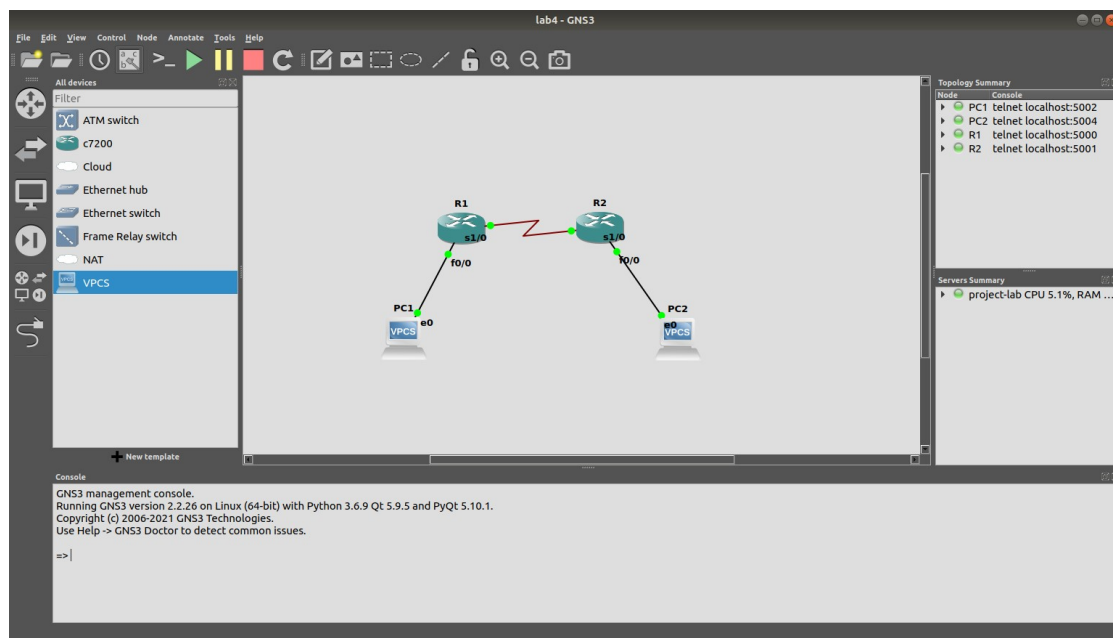


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Computer Networks Lab 4:

Computer Network Design using SWITCH and ROUTERS in GNS3

This exercise demonstrates how to log into a router and how to work with the different CiscoIOS command modes. It is important to understand the different modes so we know where we are and what commands are accepted at any time.



```

R1
File Edit View Search Terminal Help
*Oct 28 10:48:35.291: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Oct 28 10:48:35.291: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Oct 28 10:48:35.295: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Oct 28 10:48:36.147: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to down
*Oct 28 10:48:36.247: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Oct 28 10:48:36.291: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Oct 28 10:48:36.291: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Oct 28 10:48:36.295: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
R1#enable
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interf0/0
^
% Invalid input detected at '^' marker.

R1(config)#inter f0/0
R1(config-if)#ip address 20.0.0.1 255.0.0.0
R1(config-if)#no shut
R1(config-if)#
*Oct 28 10:53:08.967: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
R1(config-if)#
*Oct 28 10:53:08.967: %ENTITY_ALARM-6-INFO: CLEAR INFO Fa0/0 Physical Port Administrative State Down
*Oct 28 10:53:09.967: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config-if)#inter s1/0
R1(config-if)#ip address 10.0.0.1 255.0.0.0
R1(config-if)#no shut
R1(config-if)#
*Oct 28 10:54:45.219: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up
R1(config-if)#
*Oct 28 10:54:45.219: %ENTITY_ALARM-6-INFO: CLEAR INFO Se1/0 Physical Port Administrative State Down
R1(config-if)#
*Oct 28 10:54:46.223: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
R1(config-if)#
*Oct 28 10:55:14.223: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
R1(config-if)#
*Oct 28 10:57:44.207: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
R1(config-if)#exit
R1(config)#exit
R1#
*Oct 28 10:59:41.787: %SYS-5-CONFIG_I: Configured from console by console
R1#conf
Configuring from terminal, memory, or network [terminal]? t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip route 30.0.0.0 255.0.0.0 10.0.0.2
R1(config)#

```

```

R2
File Edit View Search Terminal Help
*Oct 28 10:48:34.811: %ENTITY_ALARM-6-INFO: ASSERT INFO Se1/3 Physical Port Administrative State Down
*Oct 28 10:48:34.811: %SNMP-5-COLDSTART: SNMP agent on host R2 is undergoing a cold start
*Oct 28 10:48:35.147: %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to administratively down
*Oct 28 10:48:35.247: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Oct 28 10:48:35.291: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Oct 28 10:48:35.291: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Oct 28 10:48:35.295: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
*Oct 28 10:48:36.147: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to down
*Oct 28 10:48:36.247: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
*Oct 28 10:48:36.291: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
*Oct 28 10:48:36.291: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
*Oct 28 10:48:36.295: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
R2#enable
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#interface f0/0
R2(config-if)#ip address 30.0.0.1 255.0.0.0
R2(config-if)#no shut
R2(config-if)#
*Oct 28 10:52:44.771: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
R2(config-if)#
*Oct 28 10:52:44.771: %ENTITY_ALARM-6-INFO: CLEAR INFO Fa0/0 Physical Port Administrative State Down
*Oct 28 10:52:45.771: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R2(config-if)#inter s1/0
R2(config-if)#ip address 10.0.0.2 255.0.0.0
R2(config-if)#no shut
R2(config-if)#
*Oct 28 10:53:57.099: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up
R2(config-if)#
*Oct 28 10:53:57.099: %ENTITY_ALARM-6-INFO: CLEAR INFO Se1/0 Physical Port Administrative State Down
R2(config-if)#
*Oct 28 10:53:58.103: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
R2(config-if)#exit
R2(config)#exit
R2#
*Oct 28 10:54:35.771: %SYS-5-CONFIG_I: Configured from console by console
R2#show ip address
^
% Invalid input detected at '^' marker.

R2#conf
Configuring from terminal, memory, or network [terminal]? t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip route 20.0.0.0 255.0.0.0 10.0.0.1
R2(config)#

```

```
PC1
File Edit View Search Terminal Help
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^['.

Welcome to Virtual PC Simulator, version 0.8.2
Dedicated to Daling.
Build time: Aug 23 2021 11:15:00
Copyright (c) 2007-2015, Paul Meng (mirnshi@gmail.com)
All rights reserved.

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 wtkl.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC1> ip 20.0.0.2/8
Checking for duplicate address...
PC1 : 20.0.0.2 255.0.0.0

PC1> ip 20.0.0.2/8 20.0.0.1
Checking for duplicate address...
PC1 : 20.0.0.2 255.0.0.0 gateway 20.0.0.1

PC1> 
```

```
PC2
File Edit View Search Terminal Help

Welcome to Virtual PC Simulator, version 0.8.2
Dedicated to Daling.
Build time: Aug 23 2021 11:15:00
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Source code and license can be found at vpcs.sf.net.
For more information, please visit wtkl.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC2> ip 30.0.0.2/8 30.0.0.1
Checking for duplicate address...
PC2 : 30.0.0.2 255.0.0.0 gateway 30.0.0.1

PC2> ping 20.0.0.2

*30.0.0.1 icmp_seq=1 ttl=255 time=30.139 ms (ICMP type:3, code:1, Destination host unreachable)
*30.0.0.1 icmp_seq=2 ttl=255 time=10.497 ms (ICMP type:3, code:1, Destination host unreachable)
*30.0.0.1 icmp_seq=3 ttl=255 time=9.996 ms (ICMP type:3, code:1, Destination host unreachable)
*30.0.0.1 icmp_seq=4 ttl=255 time=9.387 ms (ICMP type:3, code:1, Destination host unreachable)
*30.0.0.1 icmp_seq=5 ttl=255 time=10.380 ms (ICMP type:3, code:1, Destination host unreachable)

PC2> ping 20.0.0.2

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

PC2> ping 20.0.0.2

84 bytes from 20.0.0.2 icmp_seq=1 ttl=62 time=30.668 ms
84 bytes from 20.0.0.2 icmp_seq=2 ttl=62 time=21.212 ms
84 bytes from 20.0.0.2 icmp_seq=3 ttl=62 time=30.166 ms
84 bytes from 20.0.0.2 icmp_seq=4 ttl=62 time=30.373 ms
84 bytes from 20.0.0.2 icmp_seq=5 ttl=62 time=30.110 ms

PC2> 
```

Capturing from Standard input [R1 FastEthernet0/0 to PC1 Ethernet0]						
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help						
Apply a display filter ... <Ctrl-/> Expression... +						
No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	ca:01:0c:17:00:00	ca:01:0c:17:00:00	LOOP	60	Reply
2	10.542127	ca:01:0c:17:00:00	ca:01:0c:17:00:00	LOOP	60	Reply
3	17.253592	ca:01:0c:17:00:00	DEC-MOP-Remote-Cons...	0x0002	77	DEC DNA Remote Console
4	20.346250	30.0.0.2	20.0.0.2	ICMP	98	Echo (ping) request id=0x1f8d, seq=1/256, ttl=62 (reply in 7)
5	20.346868	Private_66:68:00	Broadcast	ARP	64	Who has 20.0.0.1? Tell 20.0.0.2 [ETHERNET FRAME CHECK SEQUENCE INCORRECT]
6	20.356484	ca:01:0c:17:00:00	Private_66:68:00	ARP	60	20.0.0.1 is at ca:01:0c:17:00:00
7	20.357624	20.0.0.2	30.0.0.2	ICMP	98	Echo (ping) reply id=0x1f8d, seq=1/256, ttl=64 (request in 4)
8	20.659875	ca:01:0c:17:00:00	ca:01:0c:17:00:00	LOOP	60	Reply
9	21.397673	30.0.0.2	20.0.0.2	ICMP	98	Echo (ping) request id=0x208d, seq=2/512, ttl=62 (reply in 10)
10	21.398315	20.0.0.2	30.0.0.2	ICMP	98	Echo (ping) reply id=0x208d, seq=2/512, ttl=64 (request in 9)
11	22.438580	30.0.0.2	20.0.0.2	ICMP	98	Echo (ping) request id=0x218d, seq=3/768, ttl=62 (reply in 12)
12	22.439247	20.0.0.2	30.0.0.2	ICMP	98	Echo (ping) reply id=0x218d, seq=3/768, ttl=64 (request in 11)
13	31.042467	ca:01:0c:17:00:00	ca:01:0c:17:00:00	LOOP	60	Reply
14	41.462797	ca:01:0c:17:00:00	ca:01:0c:17:00:00	LOOP	60	Reply

Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0

Ethernet II, Src: ca:01:0c:17:00:00 (ca:01:0c:17:00:00), Dst: ca:01:0c:17:00:00 (ca:01:0c:17:00:00)

Configuration Test Protocol (loopback)

Data (40 bytes)

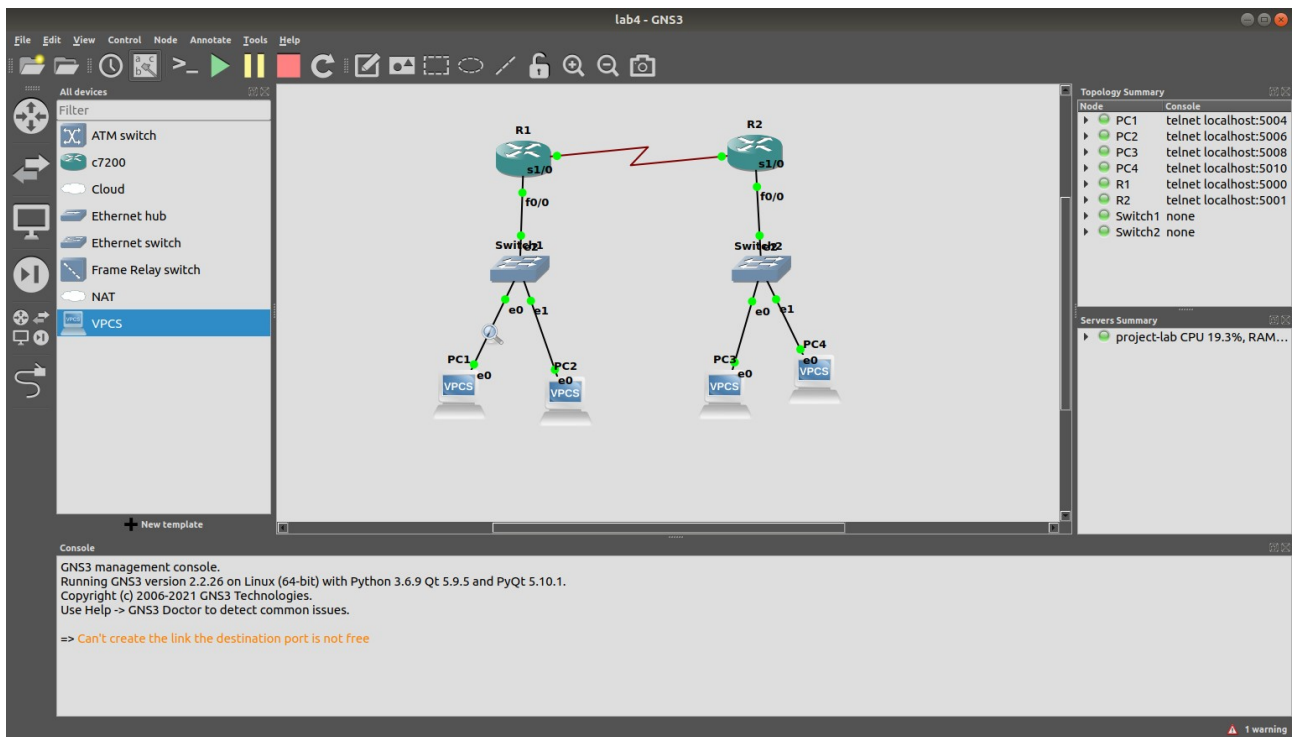
Ready to load or capture

Packets: 14 - Displayed: 14 (100.0%)

Profile: Default

Additional Exercise:

Q) Configure the below network topology as shown in Figure 7.8 and check the connectivity by pinging from PC0 to PC2.



PC2

File Edit View Search Terminal Help

Build time: Aug 23 2021 11:15:00
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For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

```
PC2> ip 10.0.0.3/8 10.0.0.1
Checking for duplicate address...
PC2 : 10.0.0.3 255.0.0.0 gateway 10.0.0.1

PC2> ping 10.0.0.2

84 bytes from 10.0.0.2 icmp_seq=1 ttl=64 time=0.508 ms
84 bytes from 10.0.0.2 icmp_seq=2 ttl=64 time=0.826 ms
84 bytes from 10.0.0.2 icmp_seq=3 ttl=64 time=0.834 ms
^C
PC2>
```

```
PC3> ip 30.0.0.2/8 30.0.0.1
Checking for duplicate address...
PC3 : 30.0.0.2 255.0.0.0 gateway 30.0.0.1
```

```
PC1
File Edit View Search Terminal Help
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For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC1> ip 10.0.0.2/8 10.0.0.1
Checking for duplicate address...
PC1 : 10.0.0.2 255.0.0.0 gateway 10.0.0.1

PC1> ping 30.0.0.2

*10.0.0.1 icmp_seq=1 ttl=255 time=29.634 ms (ICMP type:3, code:1, Destination host unreachable)
*10.0.0.1 icmp_seq=2 ttl=255 time=10.015 ms (ICMP type:3, code:1, Destination host unreachable)
*10.0.0.1 icmp_seq=3 ttl=255 time=9.911 ms (ICMP type:3, code:1, Destination host unreachable)
*10.0.0.1 icmp_seq=4 ttl=255 time=8.879 ms (ICMP type:3, code:1, Destination host unreachable)
*10.0.0.1 icmp_seq=5 ttl=255 time=8.480 ms (ICMP type:3, code:1, Destination host unreachable)

PC1> ping 30.0.0.2

30.0.0.2 icmp_seq=1 timeout
^C
PC1>
PC1> ping 30.0.0.2

84 bytes from 30.0.0.2 icmp_seq=1 ttl=62 time=31.112 ms
84 bytes from 30.0.0.2 icmp_seq=2 ttl=62 time=29.148 ms
84 bytes from 30.0.0.2 icmp_seq=3 ttl=62 time=30.118 ms
84 bytes from 30.0.0.2 icmp_seq=4 ttl=62 time=30.579 ms
84 bytes from 30.0.0.2 icmp_seq=5 ttl=62 time=29.166 ms

PC1> ping 30.0.0.2

84 bytes from 30.0.0.2 icmp_seq=1 ttl=62 time=60.117 ms
84 bytes from 30.0.0.2 icmp_seq=2 ttl=62 time=29.598 ms
84 bytes from 30.0.0.2 icmp_seq=3 ttl=62 time=30.220 ms
84 bytes from 30.0.0.2 icmp_seq=4 ttl=62 time=30.087 ms
^C
PC1> |
```

Capturing from Standard Input [PC1 Ethernet0 to Switch1 Ethernet0]

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/> Expression...

No.	Time	Source	Destination	Protocol	Length	Info
18	415.677887	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
19	478.624400	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
20	541.613876	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
21	604.477768	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
22	667.183833	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
23	730.048725	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
24	792.974822	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
25	855.940086	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
26	868.954124	ca:01:11:f4:00:00	DEC-MOP-Remote-Cons...	0x6002	77	DEC DNA Remote Console
27	918.757842	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
28	981.827031	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
29	1044.754362	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
30	1107.769443	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
31	1170.549220	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
32	1233.503497	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
33	1296.368359	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
34	1359.099566	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
35	1421.740873	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
36	1484.610821	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
37	1547.320357	ca:01:11:f4:00:00	CDP/VTP/DTP/PagP/UD...	CDP	347	Device ID: R1 Port ID: FastEthernet0/0

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)

Ready to load or capture Packets: 37 - Displayed: 37 (100.0%) Profile: Default

THE END