

## Part1

### 1. Take routing tables screenshot before/after on [r1-r4] (10%)

before

```
mininet> r1 route
Kernel IP routing table
Destination      Gateway          Genmask          Flags Metric Ref    Use Iface
10.0.1.0         0.0.0.0         255.255.255.0    U        0      0        0 r1-eth0
192.168.1.0     0.0.0.0         255.255.255.192 U        0      0        0 r1-eth1
192.168.1.64    0.0.0.0         255.255.255.192 U        0      0        0 r1-eth2
mininet> r2 route
Kernel IP routing table
Destination      Gateway          Genmask          Flags Metric Ref    Use Iface
10.0.0.0         0.0.0.0         255.255.255.0    U        0      0        0 r2-eth0
10.0.1.0         0.0.0.0         255.255.255.0    U        0      0        0 r2-eth1
mininet> r3 route
Kernel IP routing table
Destination      Gateway          Genmask          Flags Metric Ref    Use Iface
10.0.0.0         0.0.0.0         255.255.255.0    U        0      0        0 r3-eth0
10.0.2.0         0.0.0.0         255.255.255.0    U        0      0        0 r3-eth1
mininet> r4 route
Kernel IP routing table
Destination      Gateway          Genmask          Flags Metric Ref    Use Iface
10.0.2.0         0.0.0.0         255.255.255.0    U        0      0        0 r4-eth0
140.114.0.0     0.0.0.0         255.255.255.0    U        0      0        0 r4-eth1
```

after

```
mininet> r1 route
Kernel IP routing table
Destination      Gateway          Genmask          Flags Metric Ref    Use Iface
10.0.1.0         0.0.0.0         255.255.255.0    U        0      0        0 r1-eth0
140.114.0.0     10.0.1.1       255.255.255.0    UG       20     0        0 r1-eth0
192.168.1.0     0.0.0.0         255.255.255.192 U        0      0        0 r1-eth1
192.168.1.64    0.0.0.0         255.255.255.192 U        0      0        0 r1-eth2
mininet> r2 route
Kernel IP routing table
Destination      Gateway          Genmask          Flags Metric Ref    Use Iface
10.0.0.0         0.0.0.0         255.255.255.0    U        0      0        0 r2-eth0
10.0.1.0         0.0.0.0         255.255.255.0    U        0      0        0 r2-eth1
140.113.0.0     10.0.1.2       255.255.0.0      UG       20     0        0 r2-eth1
140.114.0.0     10.0.0.2       255.255.255.0    UG       20     0        0 r2-eth0
mininet> r3 route
Kernel IP routing table
Destination      Gateway          Genmask          Flags Metric Ref    Use Iface
10.0.0.0         0.0.0.0         255.255.255.0    U        0      0        0 r3-eth0
10.0.2.0         0.0.0.0         255.255.255.0    U        0      0        0 r3-eth1
140.113.0.0     10.0.0.1       255.255.0.0      UG       20     0        0 r3-eth0
140.114.0.0     10.0.2.3       255.255.255.0    UG       20     0        0 r3-eth1
mininet> r4 route
Kernel IP routing table
Destination      Gateway          Genmask          Flags Metric Ref    Use Iface
10.0.2.0         0.0.0.0         255.255.255.0    U        0      0        0 r4-eth0
140.113.0.0     10.0.2.1       255.255.0.0      UG       20     0        0 r4-eth0
140.114.0.0     0.0.0.0         255.255.255.0    U        0      0        0 r4-eth1
```

### 2. Telnet zebra and bgpd daemons of [r1-r4] and take screenshots of routes in zebra and bgpd daemons.

```
r1> sshhooww iipp bbgpp ssuummmaarryy
```

BGP router identifier 10.0.1.2, local AS number 65000

RIB entries 3, using 336 bytes of memory

Peers 1, using 9088 bytes of memory

| Neighbor | V | AS    | MsgRcvd | MsgSent | TblVer | InQ | OutQ | Up/Down  | State/PfxRcd |
|----------|---|-------|---------|---------|--------|-----|------|----------|--------------|
| 10.0.1.1 | 4 | 65001 | 204     | 207     | 0      | 0   | 0    | 00:10:06 | 1            |

Total number of neighbors 1

Total num. Established sessions 1

Total num. of routes received 1

```
zebra> sshhooww iipp rroouttee bbgpp
```

Codes: K - kernel route, C - connected, S - static, R - RIP,  
O - OSPF, I - IS-IS, B - BGP, P - PIM, A - Babel, N - NHRP,  
> - selected route, \* - FIB route

B>\* 140.114.0.0/24 [20/0] via 10.0.1.1, r1-eth0, 00:04:31

```
r2> sshhooww iipp bbgpp ssuummmaarryy
```

BGP router identifier 10.0.1.1, local AS number 65001

RIB entries 3, using 336 bytes of memory

Peers 2, using 18 KiB of memory

| Neighbor | V | AS    | MsgRcvd | MsgSent | TblVer | InQ | OutQ | Up/Down  | State/PfxRcd |
|----------|---|-------|---------|---------|--------|-----|------|----------|--------------|
| 10.0.0.2 | 4 | 65002 | 239     | 242     | 0      | 0   | 0    | 00:11:49 | 1            |
| 10.0.1.2 | 4 | 65000 | 240     | 241     | 0      | 0   | 0    | 00:11:49 | 1            |

Total number of neighbors 2

Total num. Established sessions 2

Total num. of routes received 2

```
zebra> sshhooww iipp rroouttee bbgpp
```

Codes: K - kernel route, C - connected, S - static, R - RIP,  
O - OSPF, I - IS-IS, B - BGP, P - PIM, A - Babel, N - NHRP,  
> - selected route, \* - FIB route

B>\* 140.113.0.0/16 [20/0] via 10.0.1.2, r2-eth1, 00:06:49

B>\* 140.114.0.0/24 [20/0] via 10.0.0.2, r2-eth0, 00:06:44

```
r3> sshhooww iipp bbggpp ssuummmaarryy

BGP router identifier 10.0.0.2, local AS number 65002
RIB entries 3, using 336 bytes of memory
Peers 2, using 18 KiB of memory
```

| Neighbor | V | AS    | MsgRcvd | MsgSent | TblVer | InQ | OutQ | Up/Down  | State/PfxRcd |
|----------|---|-------|---------|---------|--------|-----|------|----------|--------------|
| 10.0.0.1 | 4 | 65001 | 253     | 254     | 0      | 0   | 0    | 00:12:31 | 1            |
| 10.0.2.3 | 4 | 65003 | 252     | 255     | 0      | 0   | 0    | 00:12:31 | 1            |

```

Total number of neighbors 2

Total num. Established sessions 2
Total num. of routes received 2

```

```
zebra> sshhooww iipp rroouttee bbggpp

Codes: K - kernel route, C - connected, S - static, R - RIP,
       O - OSPF, I - IS-IS, B - BGP, P - PIM, A - Babel, N - NHRP,
       > - selected route, * - FIB route

B>* 140.113.0.0/16 [20/0] via 10.0.0.1, r3-eth0, 00:08:06
B>* 140.114.0.0/24 [20/0] via 10.0.2.3, r3-eth1, 00:08:11
```

```
r4> sshhooww iipp bbggpp ssuummmaarryy

BGP router identifier 10.0.2.3, local AS number 65003
RIB entries 3, using 336 bytes of memory
Peers 1, using 9088 bytes of memory
```

| Neighbor | V | AS    | MsgRcvd | MsgSent | TblVer | InQ | OutQ | Up/Down  | State/PfxRcd |
|----------|---|-------|---------|---------|--------|-----|------|----------|--------------|
| 10.0.2.1 | 4 | 65002 | 280     | 281     | 0      | 0   | 0    | 00:13:50 | 1            |

```

Total number of neighbors 1

Total num. Established sessions 1
Total num. of routes received 1

```

```
zebra> sshhooww iipp rroouttee bbggpp

Codes: K - kernel route, C - connected, S - static, R - RIP,
       O - OSPF, I - IS-IS, B - BGP, P - PIM, A - Babel, N - NHRP,
       > - selected route, * - FIB route

B>* 140.113.0.0/16 [20/0] via 10.0.2.1, r4-eth0, 00:08:58
```

3. Capture BGP packets from wireshark and take screenshot to verify your answer for the following questions (20%)
  1. Show BGP packets (OPEN, UPDATE, KEEP ALIVE) exchanged by r2 and r3

\*r2-eth0

| No. | Time         | Source   | Destination | Protocol | Length | Time to live | Info                                 |
|-----|--------------|----------|-------------|----------|--------|--------------|--------------------------------------|
| 9   | 18.985494435 | 10.0.0.2 | 10.0.0.1    | BGP      | 125    | 255          | OPEN Message                         |
| 14  | 17.962747646 | 10.0.0.1 | 10.0.0.2    | BGP      | 125    | 255          | OPEN Message                         |
| 16  | 17.962968803 | 10.0.0.2 | 10.0.0.1    | BGP      | 144    | 255          | OPEN Message, KEEPALIVE Message      |
| 18  | 17.963086344 | 10.0.0.1 | 10.0.0.2    | BGP      | 104    | 255          | KEEPALIVE Message, KEEPALIVE Message |
| 20  | 17.963205361 | 10.0.0.2 | 10.0.0.1    | BGP      | 85     | 255          | KEEPALIVE Message                    |
| 22  | 18.963681909 | 10.0.0.2 | 10.0.0.1    | BGP      | 89     | 255          | UPDATE Message                       |
| 24  | 18.963758945 | 10.0.0.1 | 10.0.0.2    | BGP      | 140    | 255          | UPDATE Message, UPDATE Message       |
| 26  | 20.963640630 | 10.0.0.1 | 10.0.0.2    | BGP      | 85     | 255          | KEEPALIVE Message                    |
| 27  | 20.963651395 | 10.0.0.2 | 10.0.0.1    | BGP      | 85     | 255          | KEEPALIVE Message                    |
| 30  | 23.963847416 | 10.0.0.1 | 10.0.0.2    | BGP      | 85     | 255          | KEEPALIVE Message                    |
| 31  | 23.963850273 | 10.0.0.2 | 10.0.0.1    | BGP      | 85     | 255          | KEEPALIVE Message                    |

\*r3-eth0

| No. | Time        | Source   | Destination | Protocol | Length | Time to live | Info                                 |
|-----|-------------|----------|-------------|----------|--------|--------------|--------------------------------------|
| 7   | 0.890164414 | 10.0.0.2 | 10.0.0.1    | BGP      | 125    | 255          | OPEN Message                         |
| 12  | 0.977358843 | 10.0.0.1 | 10.0.0.2    | BGP      | 125    | 255          | OPEN Message                         |
| 14  | 0.977577951 | 10.0.0.2 | 10.0.0.1    | BGP      | 144    | 255          | OPEN Message, KEEPALIVE Message      |
| 16  | 0.977697999 | 10.0.0.1 | 10.0.0.2    | BGP      | 104    | 255          | KEEPALIVE Message, KEEPALIVE Message |
| 19  | 0.977814663 | 10.0.0.2 | 10.0.0.1    | BGP      | 85     | 255          | KEEPALIVE Message                    |
| 20  | 1.978269110 | 10.0.0.2 | 10.0.0.1    | BGP      | 89     | 255          | UPDATE Message                       |
| 22  | 1.978371130 | 10.0.0.1 | 10.0.0.2    | BGP      | 140    | 255          | UPDATE Message, UPDATE Message       |
| 24  | 3.978254878 | 10.0.0.1 | 10.0.0.2    | BGP      | 85     | 255          | KEEPALIVE Message                    |
| 25  | 3.978269482 | 10.0.0.2 | 10.0.0.1    | BGP      | 85     | 255          | KEEPALIVE Message                    |
| 28  | 6.978457671 | 10.0.0.2 | 10.0.0.1    | BGP      | 85     | 255          | KEEPALIVE Message                    |
| 29  | 6.978469988 | 10.0.0.1 | 10.0.0.2    | BGP      | 85     | 255          | KEEPALIVE Message                    |

- What will happen to the routing table if you set r4-eth0 down  
 關掉 r4-eth0 後 r1, r2, r3 會無法連接到 140.114.0.0/24 的網段和 r4 所以  
 routing table 會沒有他們的 entry，而 r4 的 routing table 會只有  
 140.114.0.0/24 的網段。

```
mininet> r4 ip link set r4-eth0 down
mininet> r1 route
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
10.0.1.0 0.0.0.0 255.255.255.0 U 0 0 0 r1-eth0
192.168.1.0 0.0.0.0 255.255.255.192 U 0 0 0 r1-eth1
192.168.1.64 0.0.0.0 255.255.255.192 U 0 0 0 r1-eth2
mininet> r2 route
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
10.0.0.0 0.0.0.0 255.255.255.0 U 0 0 0 r2-eth0
10.0.1.0 0.0.0.0 255.255.255.0 U 0 0 0 r2-eth1
140.113.0.0 10.0.1.2 255.255.0.0 UG 20 0 0 r2-eth1
mininet> r3 route
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
10.0.0.0 0.0.0.0 255.255.255.0 U 0 0 0 r3-eth0
10.0.2.0 0.0.0.0 255.255.255.0 U 0 0 0 r3-eth1
140.113.0.0 10.0.0.1 255.255.0.0 UG 20 0 0 r3-eth0
mininet> r4 route
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
140.114.0.0 0.0.0.0 255.255.255.0 U 0 0 0 r4-eth1
```

- How does r3 know r4 is unreachable? Explain how  
 在 r4 關掉 r4-eth 後，r3 會因為收不到 r4 的 KEEPALIVE 訊息，所以知道  
 r4 已經 unreachable。

| *r3-eth1   |              |          |             |          |        |              |           |         |
|--|--------------|----------|-------------|----------|--------|--------------|-----------|---------|
| File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help |              |          |             |          |        |              |           |         |
| bgp  |              |          |             |          |        |              |           |         |
| No.  | Time         | Source   | Destination | Protocol | Length | Time to live | Info      |         |
| 43   | 40.343893684 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 45   | 43.344408047 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 46   | 43.344508767 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 48   | 46.344773490 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 49   | 46.344828217 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 51   | 49.345105799 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 52   | 49.345176012 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 54   | 52.345143513 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 55   | 52.345289078 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 57   | 55.345365316 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 58   | 55.345423133 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 60   | 58.346102744 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 61   | 58.346152871 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 63   | 61.346530820 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 64   | 61.346576878 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 66   | 64.346661717 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 67   | 64.346712341 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 69   | 67.347165685 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 70   | 67.347210232 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 72   | 70.347644142 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 73   | 70.347711732 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 75   | 73.347879452 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 76   | 73.347955715 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 78   | 76.348393161 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 79   | 76.348467268 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 81   | 79.348746951 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 82   | 79.348794757 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 84   | 82.348999498 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 85   | 82.348906091 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 87   | 85.349192677 | 10.0.2.1 | 10.0.2.3    | BGP      | 85     | 255          | KEEPALIVE | Message |
| 88   | 85.349240997 | 10.0.2.3 | 10.0.2.1    | BGP      | 85     | 255          | KEEPALIVE | Message |

4. How does r2 know r4 is unreachable? Explain how  
 r3 會傳 BGP 的 UPDATE Message 告訴 r2，140.114.0.0/24 已經 unreachable。

|    |              |          |          |     |    |     |           |         |
|----|--------------|----------|----------|-----|----|-----|-----------|---------|
| 77 | 51.992521203 | 10.0.0.2 | 10.0.0.1 | BGP | 85 | 255 | KEEPALIVE | Message |
| 79 | 54.993263907 | 10.0.0.1 | 10.0.0.2 | BGP | 85 | 255 | KEEPALIVE | Message |
| 80 | 54.993339168 | 10.0.0.2 | 10.0.0.1 | BGP | 85 | 255 | KEEPALIVE | Message |
| 82 | 57.994051970 | 10.0.0.1 | 10.0.0.2 | BGP | 85 | 255 | KEEPALIVE | Message |
| 83 | 57.994110370 | 10.0.0.2 | 10.0.0.1 | BGP | 85 | 255 | KEEPALIVE | Message |
| 85 | 60.994821651 | 10.0.0.1 | 10.0.0.2 | BGP | 85 | 255 | KEEPALIVE | Message |
| 86 | 60.994876084 | 10.0.0.2 | 10.0.0.1 | BGP | 85 | 255 | KEEPALIVE | Message |
| 88 | 61.079882452 | 10.0.0.2 | 10.0.0.1 | BGP | 93 | 255 | UPDATE    | Message |
| 92 | 63.995822973 | 10.0.0.1 | 10.0.0.2 | BGP | 85 | 255 | KEEPALIVE | Message |
| 93 | 63.995881019 | 10.0.0.2 | 10.0.0.1 | BGP | 85 | 255 | KEEPALIVE | Message |
| 95 | 66.995894159 | 10.0.0.1 | 10.0.0.2 | BGP | 85 | 255 | KEEPALIVE | Message |
| 96 | 66.995961359 | 10.0.0.2 | 10.0.0.1 | BGP | 85 | 255 | KEEPALIVE | Message |

▶ Frame 88: 93 bytes on wire (744 bits), 93 bytes captured (744 bits) on interface 0  
 ▶ Ethernet II, Src: 56:34:3c:0d:01:88 (56:34:3c:0d:01:88), Dst: 3a:db:3d:50:22:0c (3a:db:3d:50:22:0c)  
 ▶ Internet Protocol Version 4, Src: 10.0.0.2, Dst: 10.0.0.1  
 ▶ Transmission Control Protocol, Src Port: 179, Dst Port: 44594, Seq: 553, Ack: 552, Len: 27  
 ▼ Border Gateway Protocol - UPDATE Message  
   Marker: ffffffffffffffffffffffffffffffffff  
   Length: 27  
   Type: UPDATE Message (2)  
   Withdrawn Routes Length: 4  
   ▼ Withdrawn Routes  
     ▶ 140.114.0.0/24  
   Total Path Attribute Length: 0

## Part2

1. Take screenshot of curl result

```
mininet> h4 curl 140.113.0.40:80
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 3.2 Final//EN"><html>
<title>Directory listing for /</title>
<body>
<h2>Directory listing for /</h2>
<hr>
<ul>
<li><a href="configs/">configs</a>
<li><a href="dhcpd.conf">dhcpd.conf</a>
<li><a href="topology.py">topology.py</a>
</ul>
<hr>
</body>
</html>
```

2. Check reachability and take screenshot

```

mininet> h1 ping h4 -c 1
PING 140.114.0.1 (140.114.0.1) 56(84) bytes of data.
64 bytes from 140.114.0.1: icmp_seq=1 ttl=60 time=0.274 ms

--- 140.114.0.1 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.274/0.274/0.274/0.000 ms
mininet> h2 ping h4 -c 1
PING 140.114.0.1 (140.114.0.1) 56(84) bytes of data.
64 bytes from 140.114.0.1: icmp_seq=1 ttl=60 time=0.264 ms

--- 140.114.0.1 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.264/0.264/0.264/0.000 ms
mininet> h3 ping h4 -c 1
QStandardPaths: XDG_RUNTIME_DIR not set, defaulting to '/tmp/runtime-root'
192.168.1.3 - - [26/Mar/2021 11:49:19] "GET / HTTP/1.1" 200 -
140.114.0.1 - - [26/Mar/2021 12:19:58] "GET / HTTP/1.1" 200 -
PING 140.114.0.1 (140.114.0.1) 56(84) bytes of data.
64 bytes from 140.114.0.1: icmp_seq=1 ttl=60 time=0.260 ms

--- 140.114.0.1 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.260/0.260/0.260/0.000 ms

```

### 3. Run wireshark on r1 to take screenshot of input/output packet (10%)

從 r1-eth0 的前兩個 packet 是 h1 ping h4 的 icmp packet，從 r1-eth1 進來的 192.168.1.3 因為 source nat 的關係，所以出去的時候變成 140.113.0.30，從 r1-eth0 進來的要傳給 140.113.0.30 的 packet 因為 destination nat 的關係變成傳給 192.168.1.3。

從 r1-eth0 的後兩個 packet 是 h1 ping h4 的 icmp packet，從 r1-eth2 進來的 192.168.1.65 因為 source nat 的關係，所以出去的時候變成 140.113.0.40，從 r1-eth0 進來的要傳給 140.113.0.40 的 packet 因為 destination nat 的關係變成傳給 192.168.1.65。

The following tables represent the data shown in the Wireshark packet capture screenshots for interfaces r1-eth2, r1-eth1, and r1-eth0.

| No. | Time        | Source            | Destination       | Protocol | Length | Time to live | Info  |
|-----|-------------|-------------------|-------------------|----------|--------|--------------|---|
| 1   | 0.000000000 | 192.168.1.65      | 140.114.0.1       | ICMP     | 98     | 64           | Echo (ping) request id=0x0155, seq=1/256, ttl=64 (reply in 2) |
| 2   | 0.000042480 | 140.114.0.1       | 192.168.1.65      | ICMP     | 98     | 60           | Echo (ping) reply id=0x0155, seq=1/256, ttl=60 (request in 1) |
| 3   | 5.195064839 | 32:18:20:71:05:ad | 1e:e8:c5:07:63:4d | ARP      | 42     |              | Who has 192.168.1.65? Tell 192.168.1.126                      |
| 4   | 5.196100748 | 1e:e8:c5:07:63:4d | 32:18:20:71:05:ad | ARP      | 42     |              | Who has 192.168.1.126? Tell 192.168.1.65                      |
| 5   | 5.196103910 | 32:18:20:71:05:ad | 1e:e8:c5:07:63:4d | ARP      | 42     |              | 192.168.1.126 is at 32:18:20:71:05:ad                         |
| 6   | 5.196145911 | 1e:e8:c5:07:63:4d | 32:18:20:71:05:ad | ARP      | 42     |              | 192.168.1.65 is at 1e:e8:c5:07:63:4d                          |

  

| No. | Time        | Source            | Destination       | Protocol | Length | Time to live | Info  |
|-----|-------------|-------------------|-------------------|----------|--------|--------------|---|
| 1   | 0.000000000 | 192.168.1.3       | 140.114.0.1       | ICMP     | 98     | 64           | Echo (ping) request id=0x0155, seq=1/256, ttl=64 (reply in 2) |
| 2   | 0.000053913 | 140.114.0.1       | 192.168.1.3       | ICMP     | 98     | 60           | Echo (ping) reply id=0x0155, seq=1/256, ttl=60 (request in 1) |
| 3   | 5.199306644 | 32:09:3c:dc:b1:16 | da:00:f5:3a:c1:fd | ARP      | 42     |              | Who has 192.168.1.3? Tell 192.168.1.62                        |
| 4   | 5.199443958 | da:00:f5:3a:c1:fd | 32:09:3c:dc:b1:16 | ARP      | 42     |              | Who has 192.168.1.62? Tell 192.168.1.3                        |
| 5   | 5.199446988 | 32:09:3c:dc:b1:16 | da:00:f5:3a:c1:fd | ARP      | 42     |              | 192.168.1.62 is at 32:09:3c:dc:b1:16                          |
| 6   | 5.199488044 | da:00:f5:3a:c1:fd | 32:09:3c:dc:b1:16 | ARP      | 42     |              | 192.168.1.3 is at da:00:f5:3a:c1:fd                           |

  

| No. | Time          | Source       | Destination  | Protocol | Length | Time to live | Info  |
|-----|---------------|--------------|--------------|----------|--------|--------------|---|
| 232 | 191.770065326 | 140.113.0.30 | 140.114.0.1  | ICMP     | 98     | 63           | Echo (ping) request id=0x0155, seq=1/256, ttl=63 (reply in 233) |
| 233 | 191.770095769 | 140.114.0.1  | 140.113.0.30 | ICMP     | 98     | 61           | Echo (ping) reply id=0x0155, seq=1/256, ttl=61 (request in 232) |
| 254 | 209.693389691 | 140.113.0.40 | 140.114.0.1  | ICMP     | 98     | 63           | Echo (ping) request id=0x0159, seq=1/256, ttl=63 (reply in 255) |
| 255 | 209.693414456 | 140.114.0.1  | 140.113.0.40 | ICMP     | 98     | 61           | Echo (ping) reply id=0x0159, seq=1/256, ttl=61 (request in 254) |