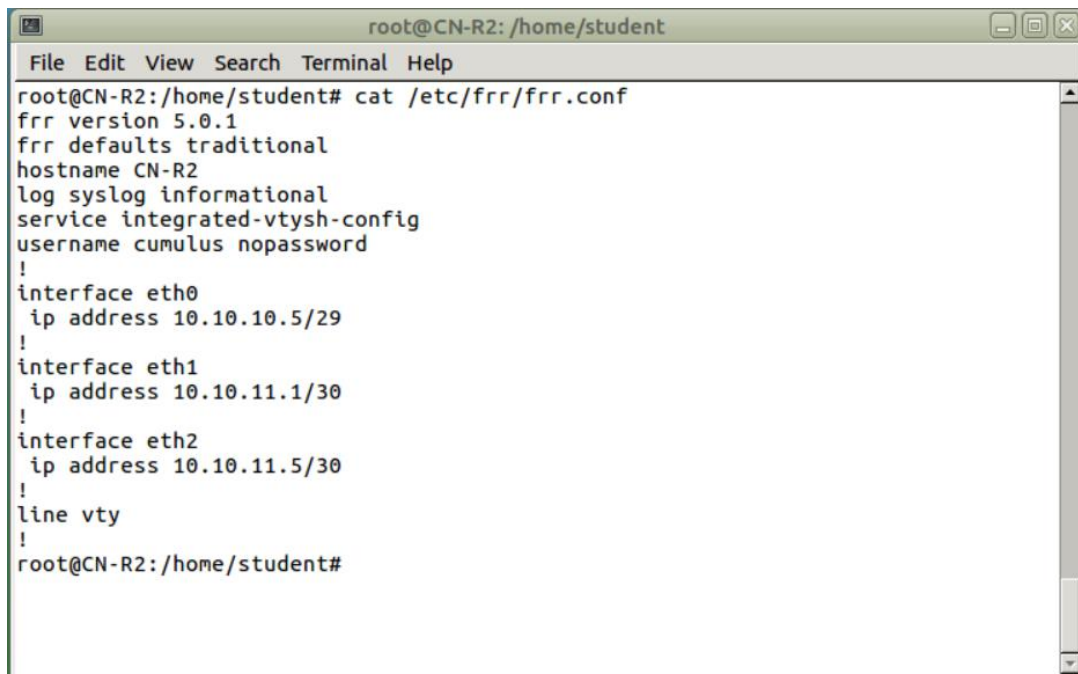


1. IP subnet tables.

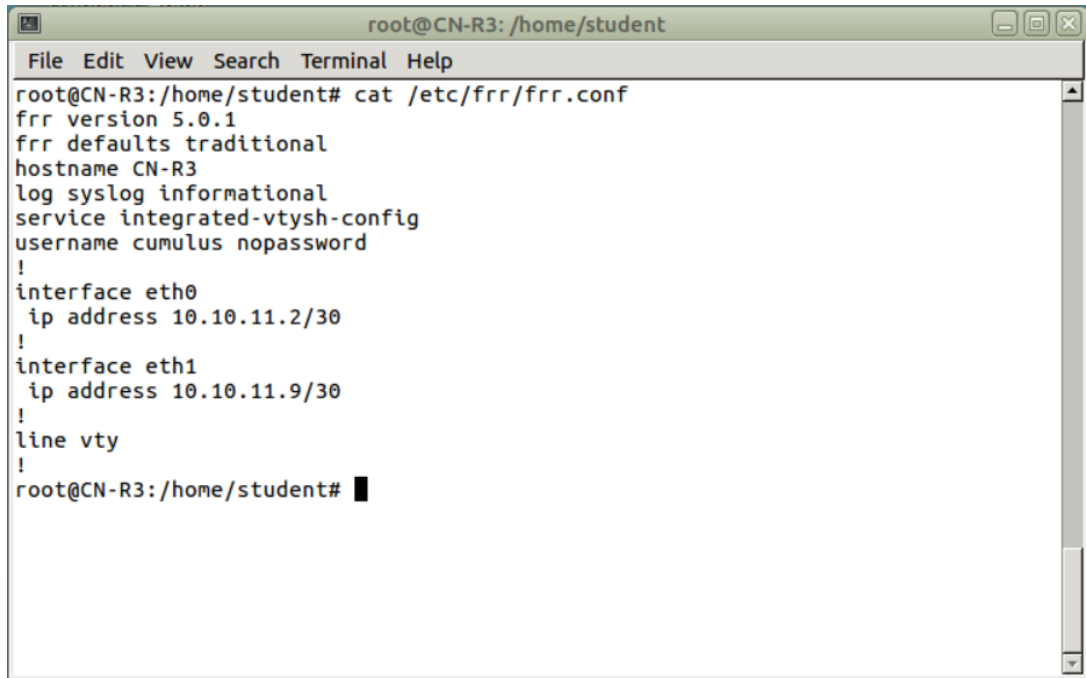
VM Subnet	IP Subnet	Network	Range	Broadcast
R2(eth1), R3(eth0)	10.10.11.0/30	10.10.11.0	10.10.11.0-10.10.11.3	10.10.11.3
R2(eth2), R4(eth1)	10.10.11.4/30	10.10.11.4	10.10.11.4-10.10.11.7	10.10.11.7
R3(eth1), R4(eth0)	10.10.11.8/30	10.10.11.8	10.10.11.8-10.10.11.11	10.10.11.11
R4(eth2)	10.10.11.12/28	10.10.11.12	10.10.11.12-10.10.11.27	10.10.11.27

2. Copies of the conf files under /etc/frr/frr.conf for each of R2, R3 and R4.



```
root@CN-R2: /home/student
File Edit View Search Terminal Help
root@CN-R2:/home/student# cat /etc/frr/frr.conf
frr version 5.0.1
frr defaults traditional
hostname CN-R2
log syslog informational
service integrated-vtysh-config
username cumulus nopassword
!
interface eth0
 ip address 10.10.10.5/29
!
interface eth1
 ip address 10.10.11.1/30
!
interface eth2
 ip address 10.10.11.5/30
!
line vty
!
root@CN-R2:/home/student#
```

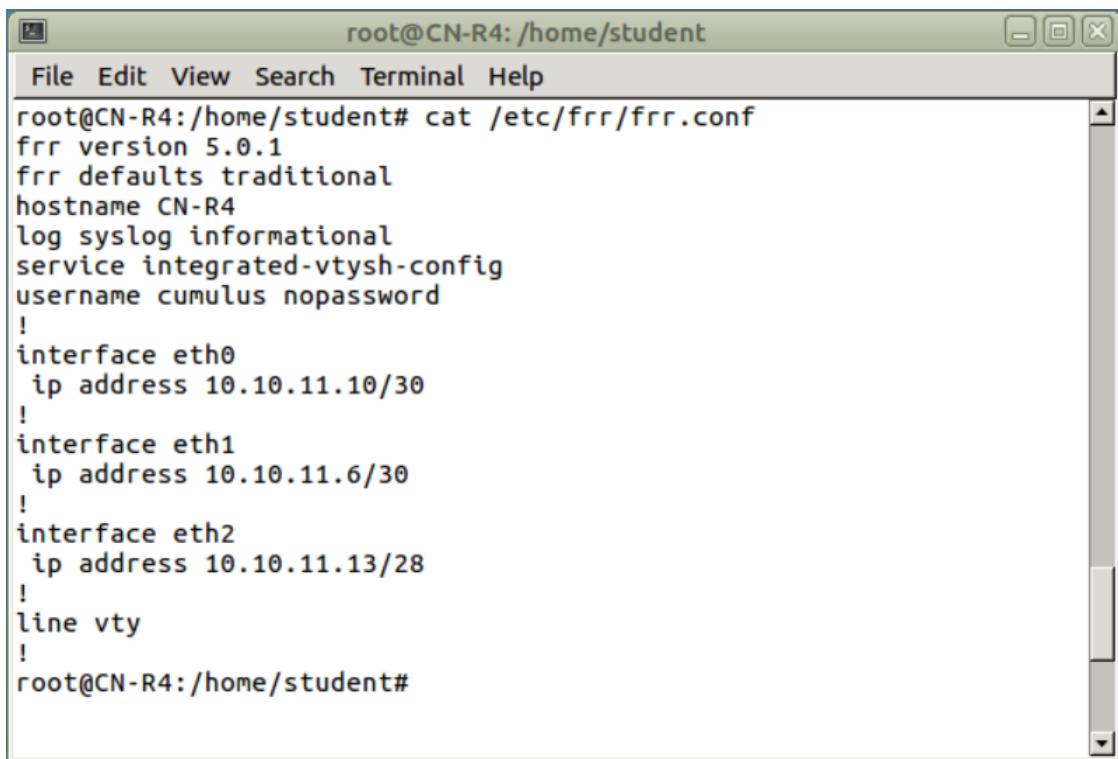
Capture 1 Config Files for R2



A terminal window titled 'root@CN-R3: /home/student' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal displays the contents of the file /etc/frr/frr.conf. The configuration includes frr version 5.0.1, frr defaults traditional, hostname CN-R3, log syslog informational, service integrated-vtysh-config, username cumulus nopassword, and two interfaces: eth0 with IP address 10.10.11.2/30 and eth1 with IP address 10.10.11.9/30. The prompt is root@CN-R3: /home/student#.

```
root@CN-R3: /home/student# cat /etc/frr/frr.conf
frr version 5.0.1
frr defaults traditional
hostname CN-R3
log syslog informational
service integrated-vtysh-config
username cumulus nopassword
!
interface eth0
 ip address 10.10.11.2/30
!
interface eth1
 ip address 10.10.11.9/30
!
line vty
!
root@CN-R3: /home/student#
```

Capture 2 Config File for R3



A terminal window titled 'root@CN-R4: /home/student' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal displays the contents of the file /etc/frr/frr.conf. The configuration includes frr version 5.0.1, frr defaults traditional, hostname CN-R4, log syslog informational, service integrated-vtysh-config, username cumulus nopassword, and three interfaces: eth0 with IP address 10.10.11.10/30, eth1 with IP address 10.10.11.6/30, and eth2 with IP address 10.10.11.13/28. The prompt is root@CN-R4: /home/student#.

```
root@CN-R4: /home/student# cat /etc/frr/frr.conf
frr version 5.0.1
frr defaults traditional
hostname CN-R4
log syslog informational
service integrated-vtysh-config
username cumulus nopassword
!
interface eth0
 ip address 10.10.11.10/30
!
interface eth1
 ip address 10.10.11.6/30
!
interface eth2
 ip address 10.10.11.13/28
!
line vty
!
root@CN-R4: /home/student#
```

Capture 3 Config File for R4

3. The Ethernet addresses of R2, R3 and R4.

```
root@CN-R2:/home/student# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:00:00:00:00:04
          inet addr:10.10.10.5  Bcast:10.10.10.7  Mask:255.255.255.248
          inet6 addr: fe80::200:ff:fe00:4/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:23 errors:0 dropped:0 overruns:0 frame:0
          TX packets:29 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:1424 (1.4 KB)  TX bytes:4216 (4.2 KB)

eth1      Link encap:Ethernet  HWaddr 00:00:00:00:00:05
          inet addr:10.10.11.1  Bcast:10.10.11.3  Mask:255.255.255.252
          inet6 addr: fe80::200:ff:fe00:5/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:49 errors:0 dropped:0 overruns:0 frame:0
          TX packets:28 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:5031 (5.0 KB)  TX bytes:4151 (4.1 KB)

eth2      Link encap:Ethernet  HWaddr 00:00:00:00:00:0c
          inet addr:10.10.11.5  Bcast:10.10.11.7  Mask:255.255.255.252
          inet6 addr: fe80::200:ff:fe00:c/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:50 errors:0 dropped:0 overruns:0 frame:0
          TX packets:29 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:5082 (5.0 KB)  TX bytes:4216 (4.2 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:1953 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1953 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:156129 (156.1 KB)  TX bytes:156129 (156.1 KB)

root@CN-R2:/home/student#
```

Capture 4 Ethernet Address R2

```
Applications Places System
root@CN-R3:/home/student# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:00:00:00:00:06
          inet addr:10.10.11.2  Bcast:10.10.11.3  Mask:255.255.255.252
          inet6 addr: fe80::200:ff:fe00:6/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:48 errors:0 dropped:0 overruns:0 frame:0
          TX packets:28 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:4975 (4.9 KB)  TX bytes:4151 (4.1 KB)

eth1      Link encap:Ethernet  HWaddr 00:00:00:00:00:07
          inet addr:10.10.11.9  Bcast:10.10.11.11  Mask:255.255.255.252
          inet6 addr: fe80::200:ff:fe00:7/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:50 errors:0 dropped:0 overruns:0 frame:0
          TX packets:29 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:5088 (5.0 KB)  TX bytes:4216 (4.2 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:2129 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2129 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:170161 (170.1 KB)  TX bytes:170161 (170.1 KB)

root@CN-R3:/home/student#
```

Capture 5 Ethernet Address R3

Tanmay Dureja
Assignment : IP Interfaces Part 2

```
root@CN-R4: /home/student
File Edit View Search Terminal Help
root@CN-R4:/home/student# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:00:00:00:00:08
          inet addr:10.10.11.10  Bcast:10.10.11.11  Mask:255.255.255.252
          inet6 addr: fe80::200:ff:fe00:8/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:47 errors:0 dropped:0 overruns:0 frame:0
          TX packets:29 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:4914 (4.9 KB)  TX bytes:4222 (4.2 KB)

eth1      Link encap:Ethernet  HWaddr 00:00:00:00:00:09
          inet addr:10.10.11.6   Bcast:10.10.11.7   Mask:255.255.255.252
          inet6 addr: fe80::200:ff:fe00:9/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:47 errors:0 dropped:0 overruns:0 frame:0
          TX packets:29 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:4914 (4.9 KB)  TX bytes:4216 (4.2 KB)

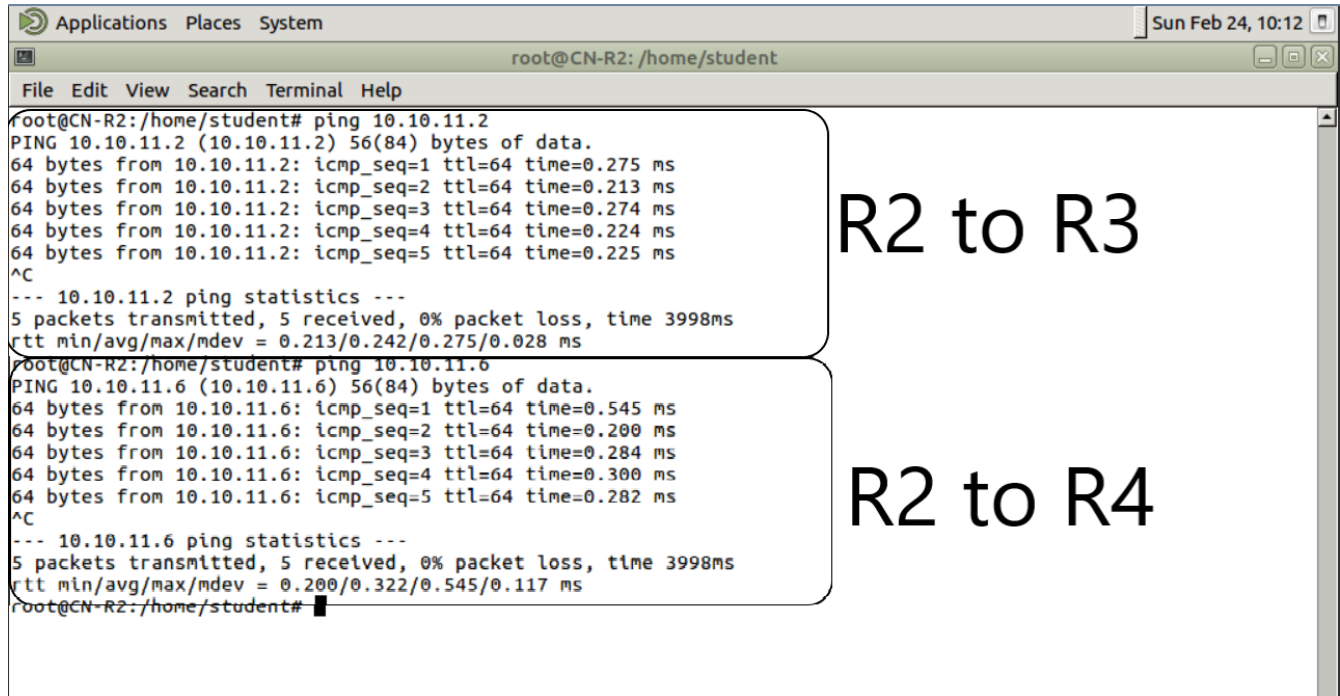
eth2      Link encap:Ethernet  HWaddr 00:00:00:00:00:0a
          inet addr:10.10.11.13  Bcast:10.10.11.15  Mask:255.255.255.240
          inet6 addr: fe80::200:ff:fe00:a/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:21 errors:0 dropped:0 overruns:0 frame:0
          TX packets:29 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:1312 (1.3 KB)  TX bytes:4222 (4.2 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1   Mask:255.0.0.0
          inet6 addr: ::1/128  Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:1409 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1409 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:112849 (112.8 KB)  TX bytes:112849 (112.8 KB)

root@CN-R4:/home/student#
```

Capture 6 Ethernet Address R4

4. Pinging between R2, R3 and R4.



The terminal window shows the following output:

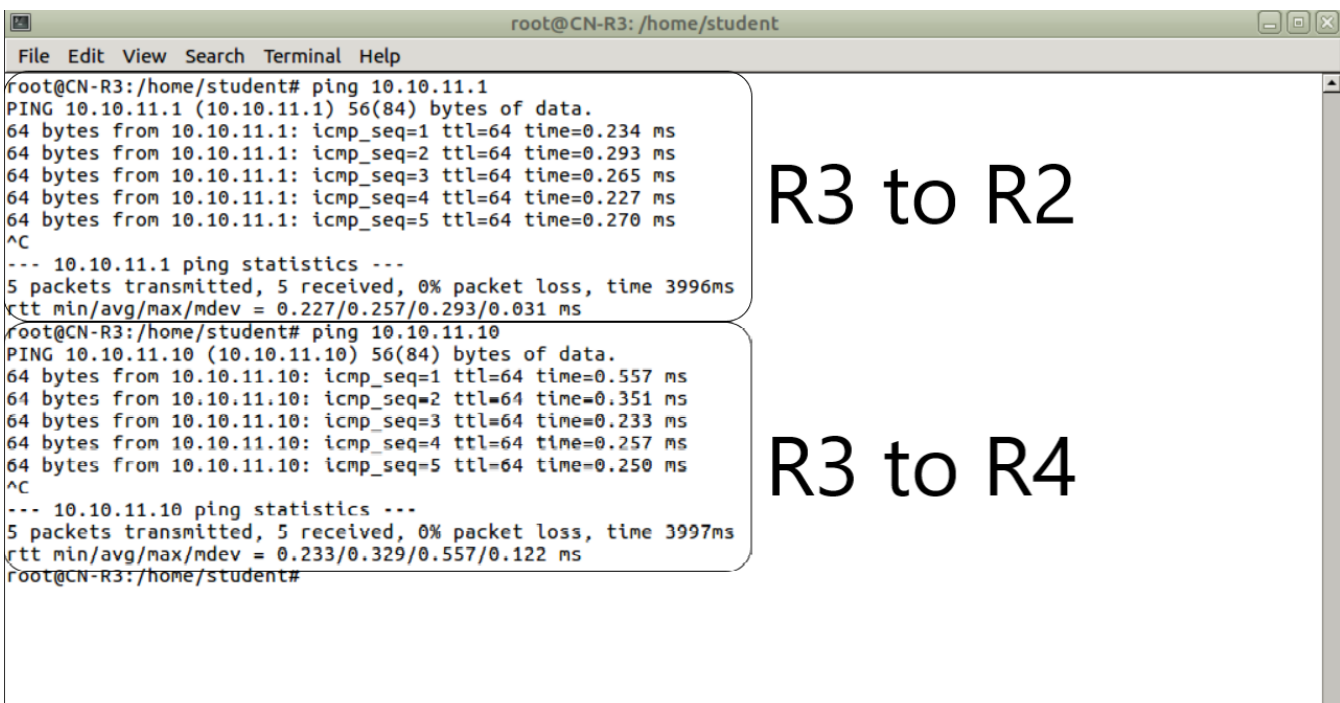
```
root@CN-R2:/home/student# ping 10.10.11.2
PING 10.10.11.2 (10.10.11.2) 56(84) bytes of data.
64 bytes from 10.10.11.2: icmp_seq=1 ttl=64 time=0.275 ms
64 bytes from 10.10.11.2: icmp_seq=2 ttl=64 time=0.213 ms
64 bytes from 10.10.11.2: icmp_seq=3 ttl=64 time=0.274 ms
64 bytes from 10.10.11.2: icmp_seq=4 ttl=64 time=0.224 ms
64 bytes from 10.10.11.2: icmp_seq=5 ttl=64 time=0.225 ms
^C
--- 10.10.11.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3998ms
rtt min/avg/max/mdev = 0.213/0.242/0.275/0.028 ms

root@CN-R2:/home/student# ping 10.10.11.6
PING 10.10.11.6 (10.10.11.6) 56(84) bytes of data.
64 bytes from 10.10.11.6: icmp_seq=1 ttl=64 time=0.545 ms
64 bytes from 10.10.11.6: icmp_seq=2 ttl=64 time=0.200 ms
64 bytes from 10.10.11.6: icmp_seq=3 ttl=64 time=0.284 ms
64 bytes from 10.10.11.6: icmp_seq=4 ttl=64 time=0.300 ms
64 bytes from 10.10.11.6: icmp_seq=5 ttl=64 time=0.282 ms
^C
--- 10.10.11.6 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3998ms
rtt min/avg/max/mdev = 0.200/0.322/0.545/0.117 ms
root@CN-R2:/home/student#
```

R2 to R3

R2 to R4

Capture 7 Ping R2 to R3, R4



The terminal window shows the following output:

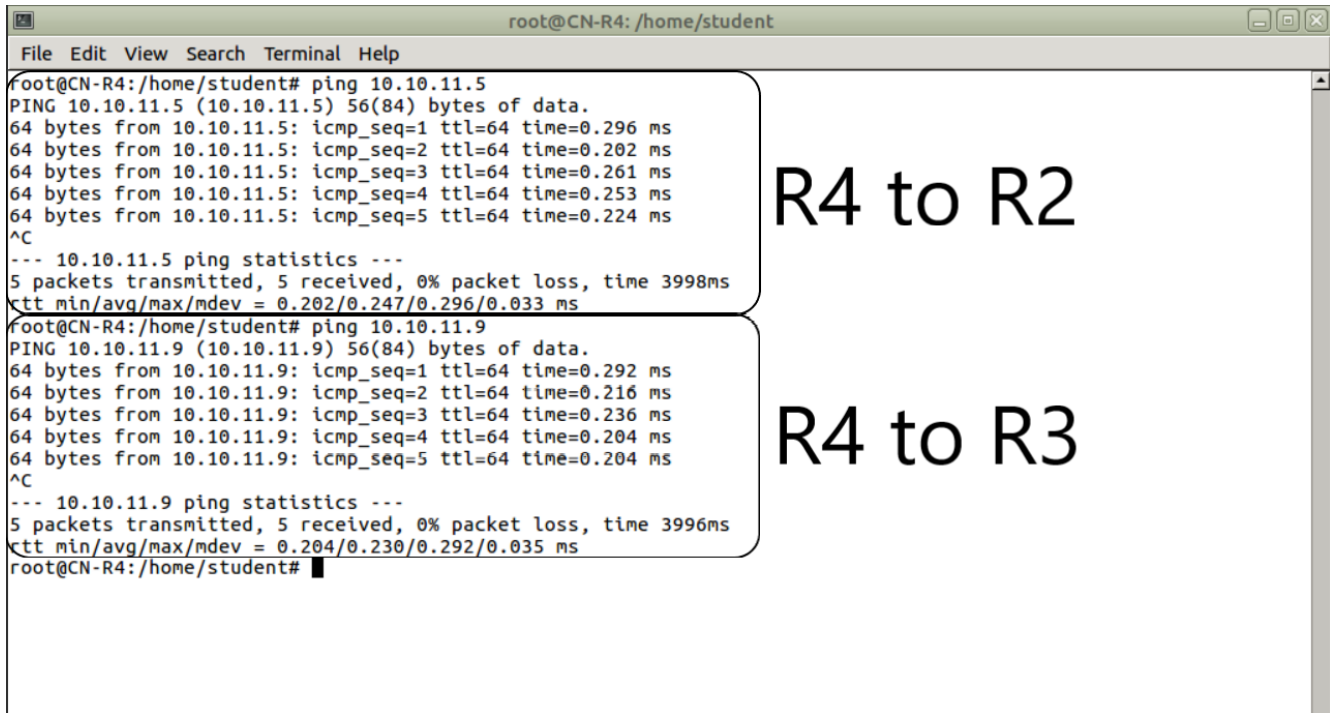
```
root@CN-R3:/home/student# ping 10.10.11.1
PING 10.10.11.1 (10.10.11.1) 56(84) bytes of data.
64 bytes from 10.10.11.1: icmp_seq=1 ttl=64 time=0.234 ms
64 bytes from 10.10.11.1: icmp_seq=2 ttl=64 time=0.293 ms
64 bytes from 10.10.11.1: icmp_seq=3 ttl=64 time=0.265 ms
64 bytes from 10.10.11.1: icmp_seq=4 ttl=64 time=0.227 ms
64 bytes from 10.10.11.1: icmp_seq=5 ttl=64 time=0.270 ms
^C
--- 10.10.11.1 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3996ms
rtt min/avg/max/mdev = 0.227/0.257/0.293/0.031 ms

root@CN-R3:/home/student# ping 10.10.11.10
PING 10.10.11.10 (10.10.11.10) 56(84) bytes of data.
64 bytes from 10.10.11.10: icmp_seq=1 ttl=64 time=0.557 ms
64 bytes from 10.10.11.10: icmp_seq=2 ttl=64 time=0.351 ms
64 bytes from 10.10.11.10: icmp_seq=3 ttl=64 time=0.233 ms
64 bytes from 10.10.11.10: icmp_seq=4 ttl=64 time=0.257 ms
64 bytes from 10.10.11.10: icmp_seq=5 ttl=64 time=0.250 ms
^C
--- 10.10.11.10 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3997ms
rtt min/avg/max/mdev = 0.233/0.329/0.557/0.122 ms
root@CN-R3:/home/student#
```

R3 to R2

R3 to R4

Capture 8 Ping R3 to R2, R4



The screenshot shows a terminal window titled 'root@CN-R4: /home/student'. It contains two ping commands and their results. The first command is 'ping 10.10.11.5', which is R2. The second command is 'ping 10.10.11.9', which is R3. Both pings show 5 successful packets with 0% loss. The results are summarized in two boxes on the right side of the terminal window.

```
root@CN-R4:/home/student# ping 10.10.11.5
PING 10.10.11.5 (10.10.11.5) 56(84) bytes of data.
64 bytes from 10.10.11.5: icmp_seq=1 ttl=64 time=0.296 ms
64 bytes from 10.10.11.5: icmp_seq=2 ttl=64 time=0.202 ms
64 bytes from 10.10.11.5: icmp_seq=3 ttl=64 time=0.261 ms
64 bytes from 10.10.11.5: icmp_seq=4 ttl=64 time=0.253 ms
64 bytes from 10.10.11.5: icmp_seq=5 ttl=64 time=0.224 ms
^C
--- 10.10.11.5 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3998ms
rtt min/avg/max/mdev = 0.202/0.247/0.296/0.033 ms
root@CN-R4:/home/student# ping 10.10.11.9
PING 10.10.11.9 (10.10.11.9) 56(84) bytes of data.
64 bytes from 10.10.11.9: icmp_seq=1 ttl=64 time=0.292 ms
64 bytes from 10.10.11.9: icmp_seq=2 ttl=64 time=0.216 ms
64 bytes from 10.10.11.9: icmp_seq=3 ttl=64 time=0.236 ms
64 bytes from 10.10.11.9: icmp_seq=4 ttl=64 time=0.204 ms
64 bytes from 10.10.11.9: icmp_seq=5 ttl=64 time=0.204 ms
^C
--- 10.10.11.9 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3996ms
rtt min/avg/max/mdev = 0.204/0.230/0.292/0.035 ms
root@CN-R4:/home/student#
```

R4 to R2

R4 to R3

Capture 9 Ping R4 to R2, R3

5. Copies of the ARP tables on R2, R3 and R4.

```
root@CN-R2: /home/student
File Edit View Search Terminal Help
root@CN-R2:/home/student# arp
Address          HWtype  HWaddress      Flags Mask    Iface
10.10.11.6       ether   00:00:00:00:00:09 C              eth2
10.10.11.2       ether   00:00:00:00:00:06 C              eth1
root@CN-R2:/home/student#
```

Capture 10 ARP Table R2

```
root@CN-R3: /home/student
File Edit View Search Terminal Help
root@CN-R3:/home/student# arp
Address          HWtype  HWaddress      Flags Mask    Iface
10.10.11.1       ether   00:00:00:00:00:05 C              eth0
10.10.11.10      ether   00:00:00:00:00:08 C              eth1
root@CN-R3:/home/student#
```

Capture 11 ARP Table R3

```
root@CN-R4: /home/student
File Edit View Search Terminal Help
root@CN-R4:/home/student# arp
Address          HWtype  HWaddress      Flags Mask    Iface
10.10.11.9       ether   00:00:00:00:00:07 C              eth0
10.10.11.5       ether   00:00:00:00:00:0c C              eth1
root@CN-R4:/home/student#
```

Capture 12 ARP Table R4