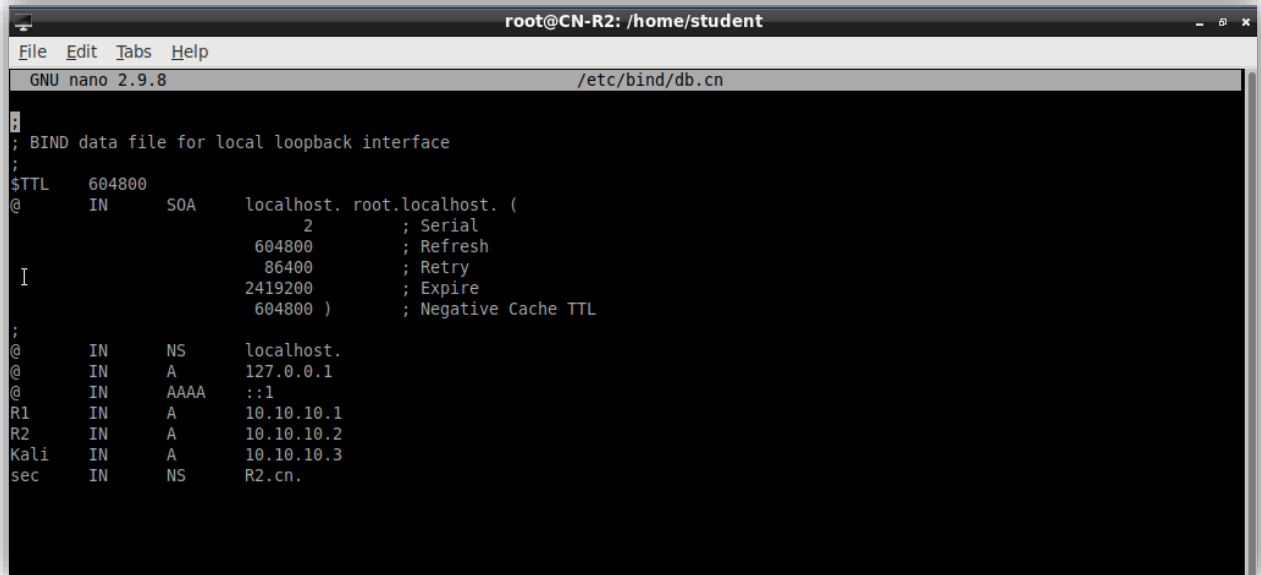


(Domain Name Server (DNS))

Forward and Reverse zone files (Primary):

Primary Zone Forward Zone File :



```
root@CN-R2: /home/student
File Edit Tabs Help
GNU nano 2.9.8 /etc/bind/db.cn

;
; BIND data file for local loopback interface
;
$TTL 604800
@      IN      SOA     localhost. root.localhost. (
                        2      ; Serial
                        604800  ; Refresh
                        86400   ; Retry
                        2419200 ; Expire
                        604800 ) ; Negative Cache TTL
;
@      IN      NS      localhost.
@      IN      A        127.0.0.1
@      IN      AAAA     ::1
R1     IN      A        10.10.10.1
R2     IN      A        10.10.10.2
Kali   IN      A        10.10.10.3
sec    IN      NS      R2.cn.
```

Primary zone Reverse Zone File :

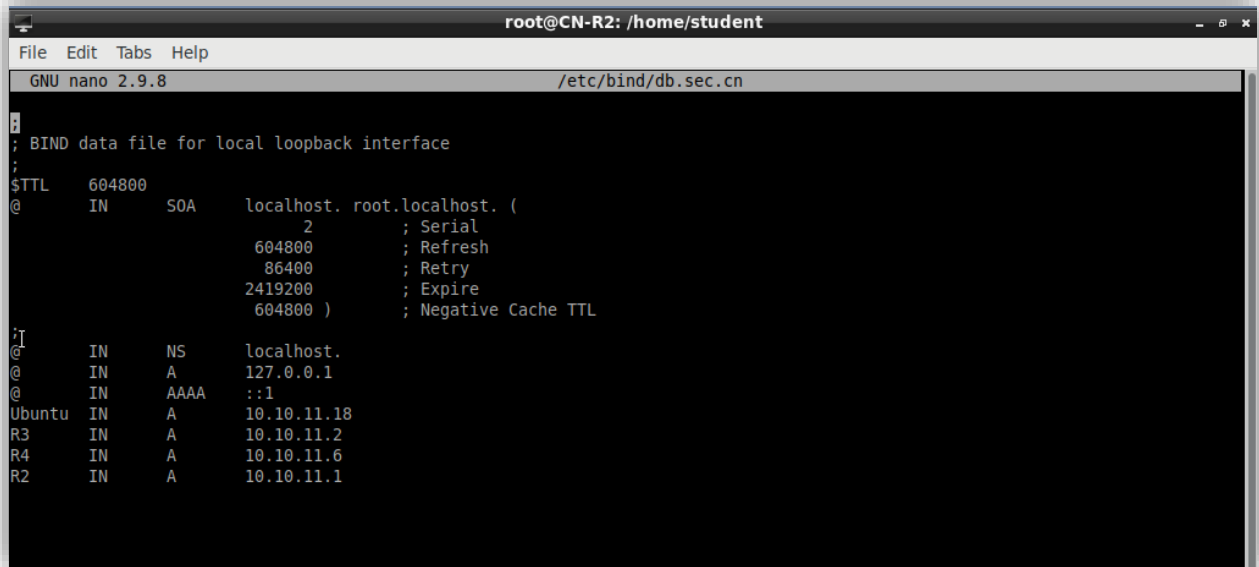


```
root@CN-R2: /home/student
File Edit Tabs Help
GNU nano 2.9.8 /etc/bind/db.10.10.10

;
; BIND data file for local loopback interface
;
$TTL 604800
@      IN      SOA     localhost. root.localhost. (
                        2      ; Serial
                        604800  ; Refresh
                        86400   ; Retry
                        2419200 ; Expire
                        604800 ) ; Negative Cache TTL
;
@      IN      NS      localhost.
@      IN      A        127.0.0.1
@      IN      AAAA     ::1
10.10.10.1 IN      PTR    R1.cn.
10.10.10.2 IN      PTR    R2.cn.
10.10.10.3 IN      PTR    Kali.cn.
```

Forward and Reverse zone files (Secondary)

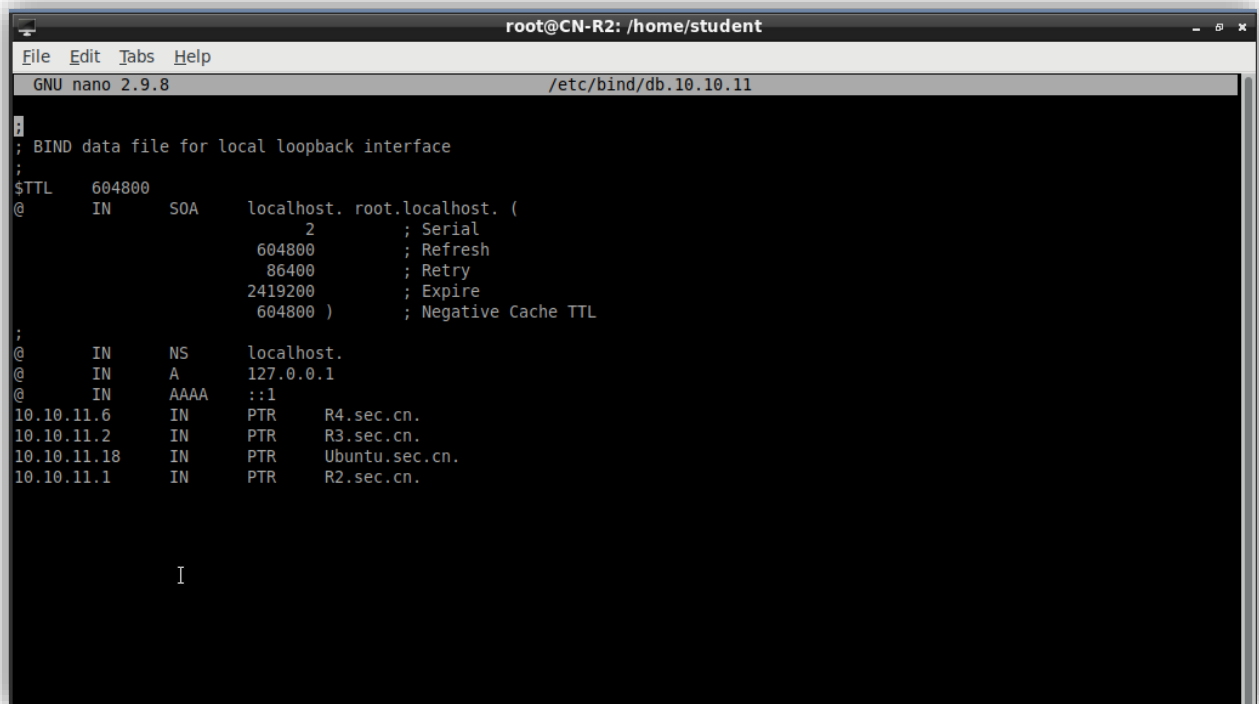
Secondary Zone Forward Zone File :



```
root@CN-R2: /home/student
File Edit Tabs Help
GNU nano 2.9.8 /etc/bind/db.sec.cn

; BIND data file for local loopback interface
;
$TTL 604800
@      IN      SOA     localhost. root.localhost. (
                        2      ; Serial
                        604800  ; Refresh
                        86400   ; Retry
                        2419200 ; Expire
                        604800 ) ; Negative Cache TTL
;
@      IN      NS      localhost.
@      IN      A       127.0.0.1
@      IN      AAAA    ::1
Ubuntu IN      A       10.10.11.18
R3     IN      A       10.10.11.2
R4     IN      A       10.10.11.6
R2     IN      A       10.10.11.1
```

Secondary Zone Reverse Zone File :

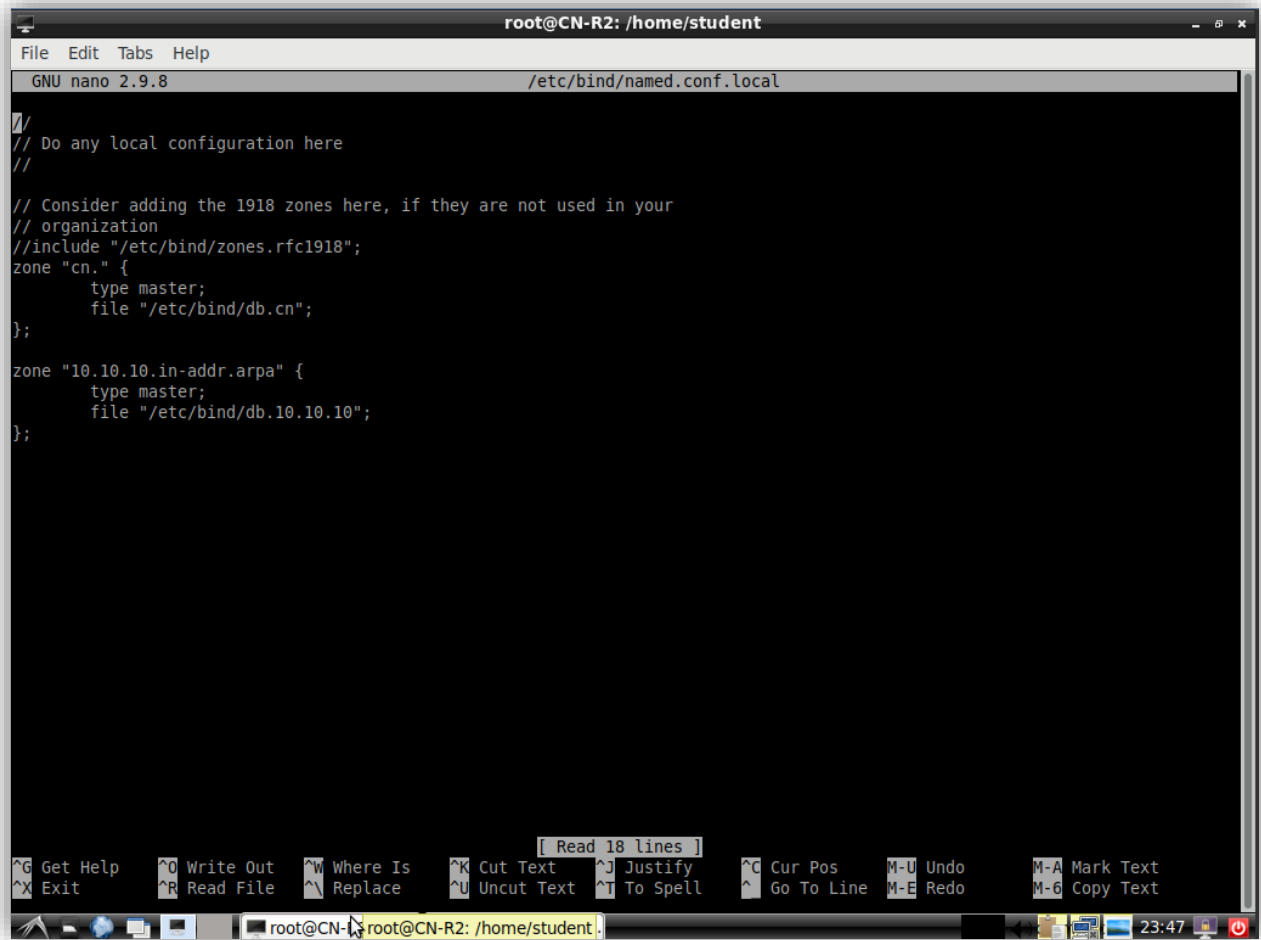


```
root@CN-R2: /home/student
File Edit Tabs Help
GNU nano 2.9.8 /etc/bind/db.10.10.11

; BIND data file for local loopback interface
;
$TTL 604800
@      IN      SOA     localhost. root.localhost. (
                        2      ; Serial
                        604800  ; Refresh
                        86400   ; Retry
                        2419200 ; Expire
                        604800 ) ; Negative Cache TTL
;
@      IN      NS      localhost.
@      IN      A       127.0.0.1
@      IN      AAAA    ::1
10.10.11.6 IN      PTR   R4.sec.cn.
10.10.11.2 IN      PTR   R3.sec.cn.
10.10.11.18 IN     PTR   Ubuntu.sec.cn.
10.10.11.1 IN      PTR   R2.sec.cn.

I
```

/etc/bind/named.conf.local file:



The screenshot shows a terminal window titled "root@CN-R2: /home/student". Inside, the GNU nano 2.9.8 editor is open, displaying the contents of the file /etc/bind/named.conf.local. The file contains configuration for two zones: a local domain "cn." and an internal network "10.10.10.in-addr.arpa". Both are configured as master zones pointing to specific database files. The nano editor's status bar at the bottom shows various keyboard shortcuts for editing and navigation. The system's taskbar at the very bottom indicates the user is root@CN-R2, the current directory is /home/student, and the time is 23:47.

```
root@CN-R2: /home/student
GNU nano 2.9.8 /etc/bind/named.conf.local

//
// Do any local configuration here
//

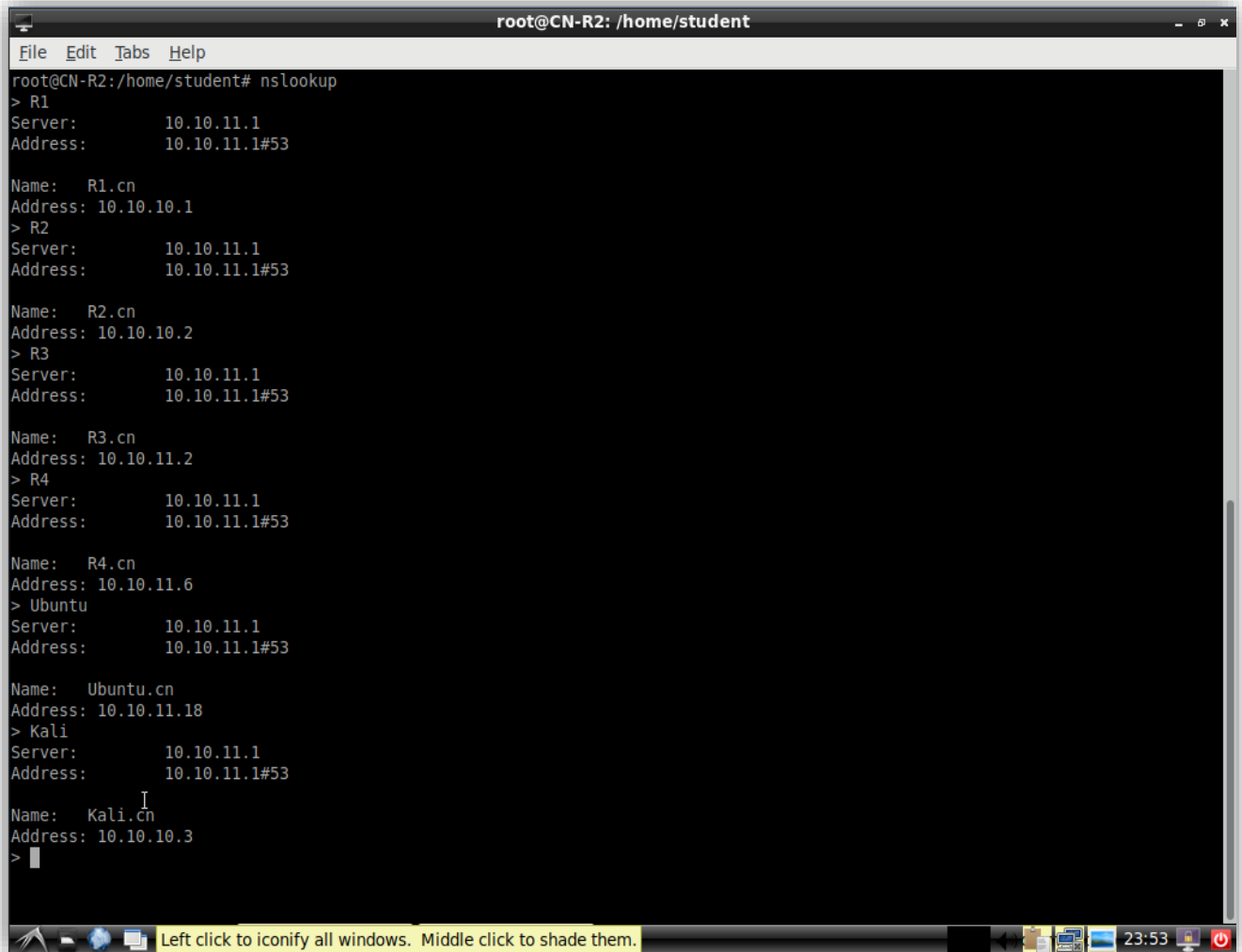
// Consider adding the 1918 zones here, if they are not used in your
// organization
//include "/etc/bind/zones.rfc1918";
zone "cn." {
    type master;
    file "/etc/bind/db.cn";
};

zone "10.10.10.in-addr.arpa" {
    type master;
    file "/etc/bind/db.10.10.10";
};

[ Read 18 lines ]
^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify
^X Exit          ^R Read File    ^_ Replace      ^U Uncut Text   ^T To Spell
^C Cur Pos       M-U Undo       M-A Mark Text
^_ Go To Line    M-E Redo       M-6 Copy Text
```

Host lookup by Name using nslookup:

Nslookup(Name) on R2:



```
root@CN-R2: /home/student
File Edit Tabs Help
root@CN-R2:/home/student# nslookup
> R1
Server:      10.10.11.1
Address:     10.10.11.1#53

Name:   R1.cn
Address: 10.10.10.1
> R2
Server:      10.10.11.1
Address:     10.10.11.1#53

Name:   R2.cn
Address: 10.10.10.2
> R3
Server:      10.10.11.1
Address:     10.10.11.1#53

Name:   R3.cn
Address: 10.10.11.2
> R4
Server:      10.10.11.1
Address:     10.10.11.1#53

Name:   R4.cn
Address: 10.10.11.6
> Ubuntu
Server:      10.10.11.1
Address:     10.10.11.1#53

Name:   Ubuntu.cn
Address: 10.10.11.18
> Kali
Server:      10.10.11.1
Address:     10.10.11.1#53

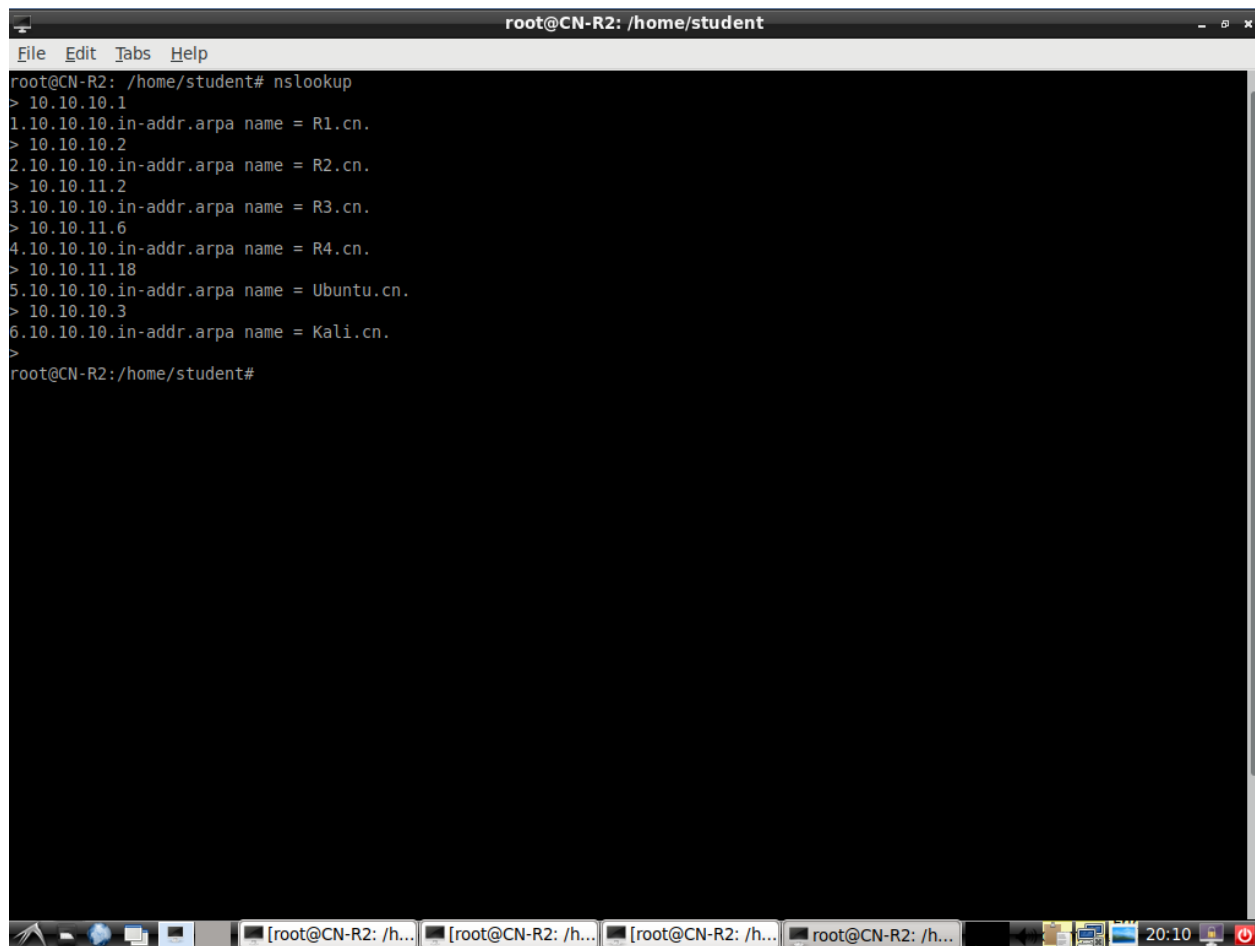
Name:   Kali.cn
Address: 10.10.10.3
> 
```

Left click to iconify all windows. Middle click to shade them.

23:53

Host lookup by Address using nslookup:

Nslookup(Address) on R2:

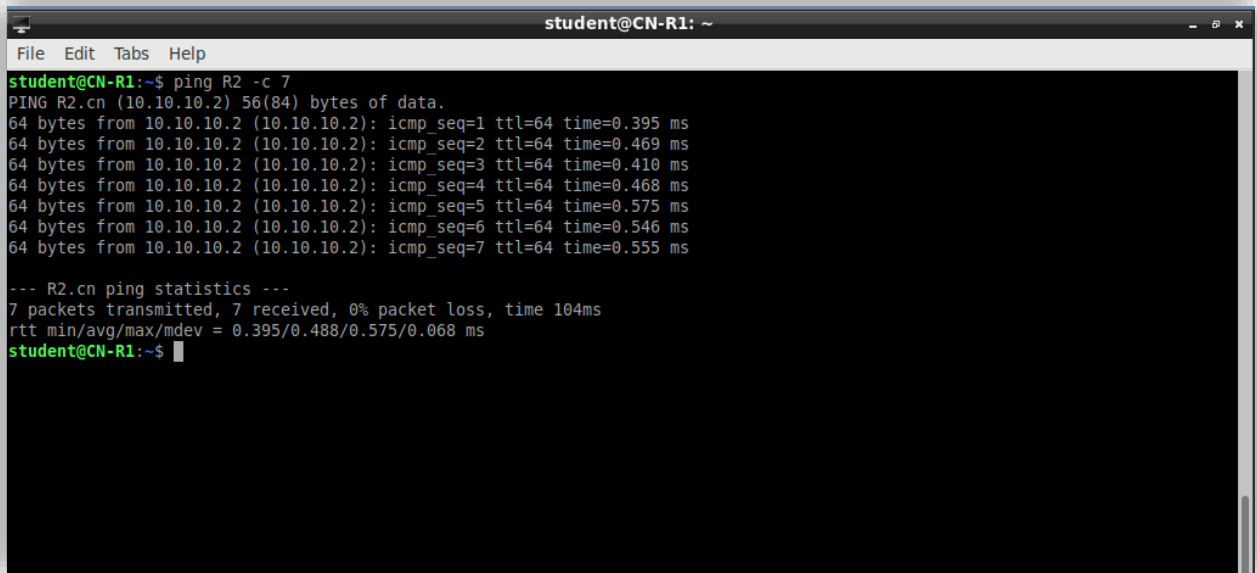


```
root@CN-R2: /home/student
File Edit Tabs Help
root@CN-R2: /home/student# nslookup
> 10.10.10.1
1.10.10.10.in-addr.arpa name = R1.cn.
> 10.10.10.2
2.10.10.10.in-addr.arpa name = R2.cn.
> 10.10.11.2
3.10.10.10.in-addr.arpa name = R3.cn.
> 10.10.11.6
4.10.10.10.in-addr.arpa name = R4.cn.
> 10.10.11.18
5.10.10.10.in-addr.arpa name = Ubuntu.cn.
> 10.10.10.3
6.10.10.10.in-addr.arpa name = Kali.cn.
>
root@CN-R2: /home/student#
```

The screenshot shows a terminal window titled 'root@CN-R2: /home/student'. The user has executed the 'nslookup' command. The terminal displays a series of IP addresses followed by their corresponding hostnames in reverse DNS format. The IP addresses are 10.10.10.1, 10.10.10.2, 10.10.11.2, 10.10.11.6, 10.10.11.18, and 10.10.10.3. The hostnames are R1.cn, R2.cn, R3.cn, R4.cn, Ubuntu.cn, and Kali.cn respectively. The terminal window has a menu bar with 'File', 'Edit', 'Tabs', and 'Help'. The bottom of the window shows a taskbar with several open terminal windows and a system clock displaying '20:10'.

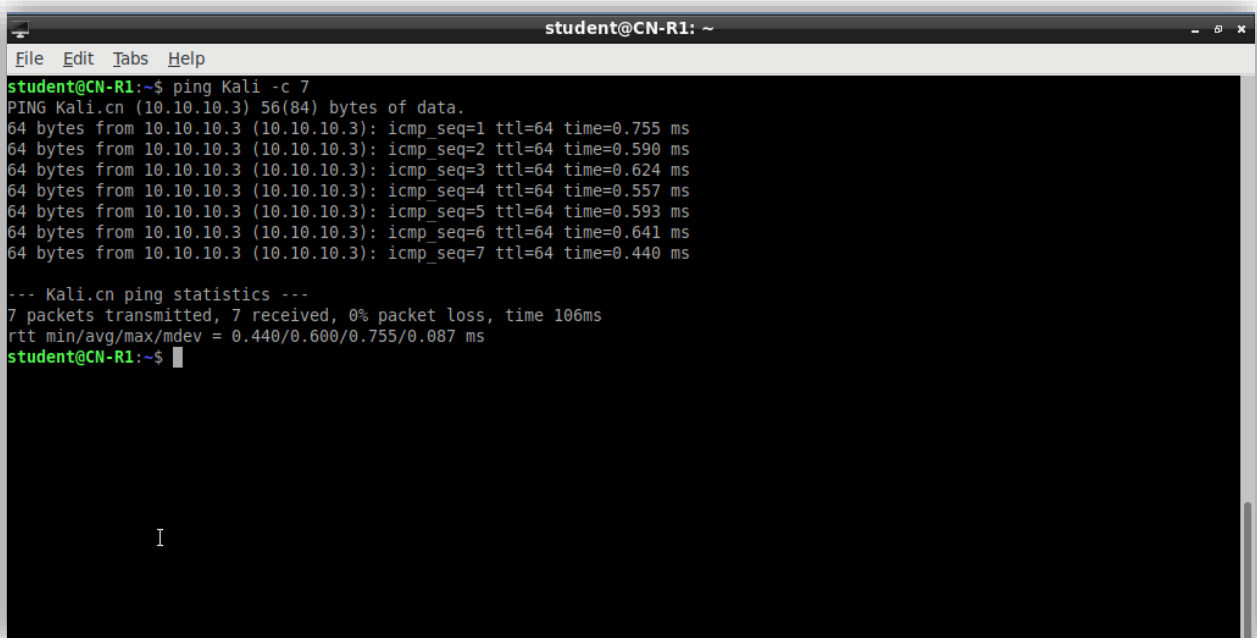
Screenshots of R1 pinging R2 and Kali:

R1 pinging R2:

A terminal window titled 'student@CN-R1: ~' showing the execution of a ping command to R2. The command is 'ping R2 -c 7'. The output shows seven successful ping requests to 10.10.10.2 with varying response times. A summary line indicates 7 packets transmitted, 7 received, 0% packet loss, and a total time of 104ms. The RTT statistics are: min/avg/max/mdev = 0.395/0.488/0.575/0.068 ms.

```
student@CN-R1: ~  
File Edit Tabs Help  
student@CN-R1:~$ ping R2 -c 7  
PING R2.cn (10.10.10.2) 56(84) bytes of data.  
64 bytes from 10.10.10.2 (10.10.10.2): icmp_seq=1 ttl=64 time=0.395 ms  
64 bytes from 10.10.10.2 (10.10.10.2): icmp_seq=2 ttl=64 time=0.469 ms  
64 bytes from 10.10.10.2 (10.10.10.2): icmp_seq=3 ttl=64 time=0.410 ms  
64 bytes from 10.10.10.2 (10.10.10.2): icmp_seq=4 ttl=64 time=0.468 ms  
64 bytes from 10.10.10.2 (10.10.10.2): icmp_seq=5 ttl=64 time=0.575 ms  
64 bytes from 10.10.10.2 (10.10.10.2): icmp_seq=6 ttl=64 time=0.546 ms  
64 bytes from 10.10.10.2 (10.10.10.2): icmp_seq=7 ttl=64 time=0.555 ms  
  
--- R2.cn ping statistics ---  
7 packets transmitted, 7 received, 0% packet loss, time 104ms  
rtt min/avg/max/mdev = 0.395/0.488/0.575/0.068 ms  
student@CN-R1:~$
```

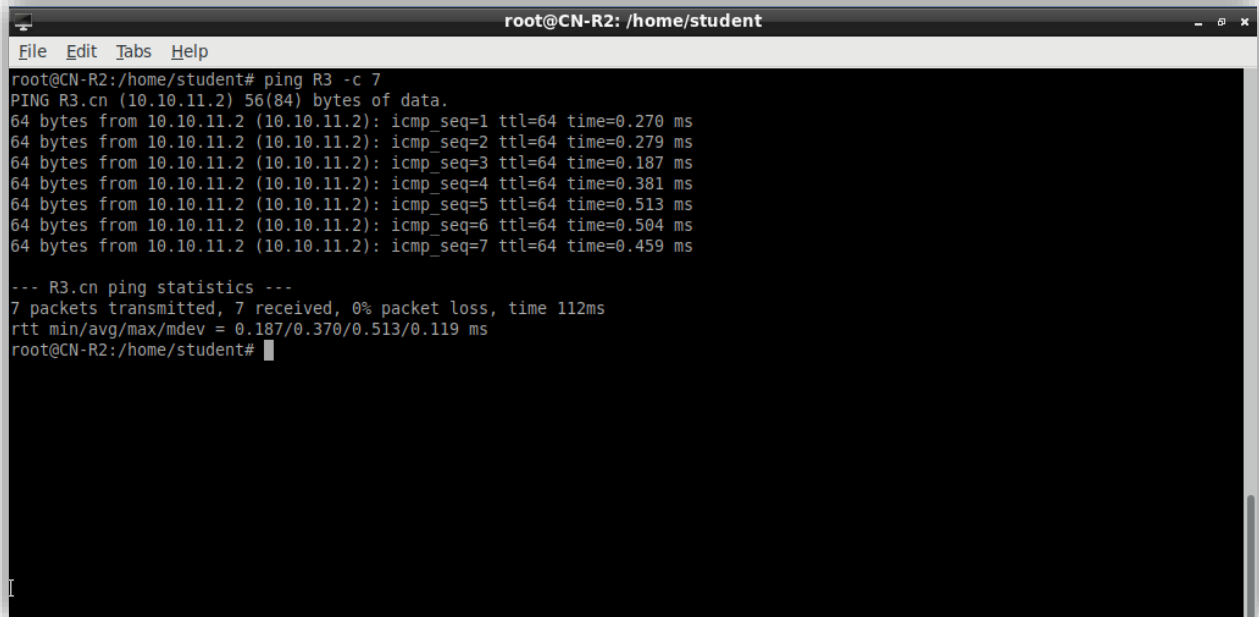
R1 pinging Kali:

A terminal window titled 'student@CN-R1: ~' showing the execution of a ping command to Kali. The command is 'ping Kali -c 7'. The output shows seven successful ping requests to 10.10.10.3 with varying response times. A summary line indicates 7 packets transmitted, 7 received, 0% packet loss, and a total time of 106ms. The RTT statistics are: min/avg/max/mdev = 0.440/0.600/0.755/0.087 ms.

```
student@CN-R1: ~  
File Edit Tabs Help  
student@CN-R1:~$ ping Kali -c 7  
PING Kali.cn (10.10.10.3) 56(84) bytes of data.  
64 bytes from 10.10.10.3 (10.10.10.3): icmp_seq=1 ttl=64 time=0.755 ms  
64 bytes from 10.10.10.3 (10.10.10.3): icmp_seq=2 ttl=64 time=0.590 ms  
64 bytes from 10.10.10.3 (10.10.10.3): icmp_seq=3 ttl=64 time=0.624 ms  
64 bytes from 10.10.10.3 (10.10.10.3): icmp_seq=4 ttl=64 time=0.557 ms  
64 bytes from 10.10.10.3 (10.10.10.3): icmp_seq=5 ttl=64 time=0.593 ms  
64 bytes from 10.10.10.3 (10.10.10.3): icmp_seq=6 ttl=64 time=0.641 ms  
64 bytes from 10.10.10.3 (10.10.10.3): icmp_seq=7 ttl=64 time=0.440 ms  
  
--- Kali.cn ping statistics ---  
7 packets transmitted, 7 received, 0% packet loss, time 106ms  
rtt min/avg/max/mdev = 0.440/0.600/0.755/0.087 ms  
student@CN-R1:~$
```

Screenshots of R2 pinging R3, R4, and Ubuntu:

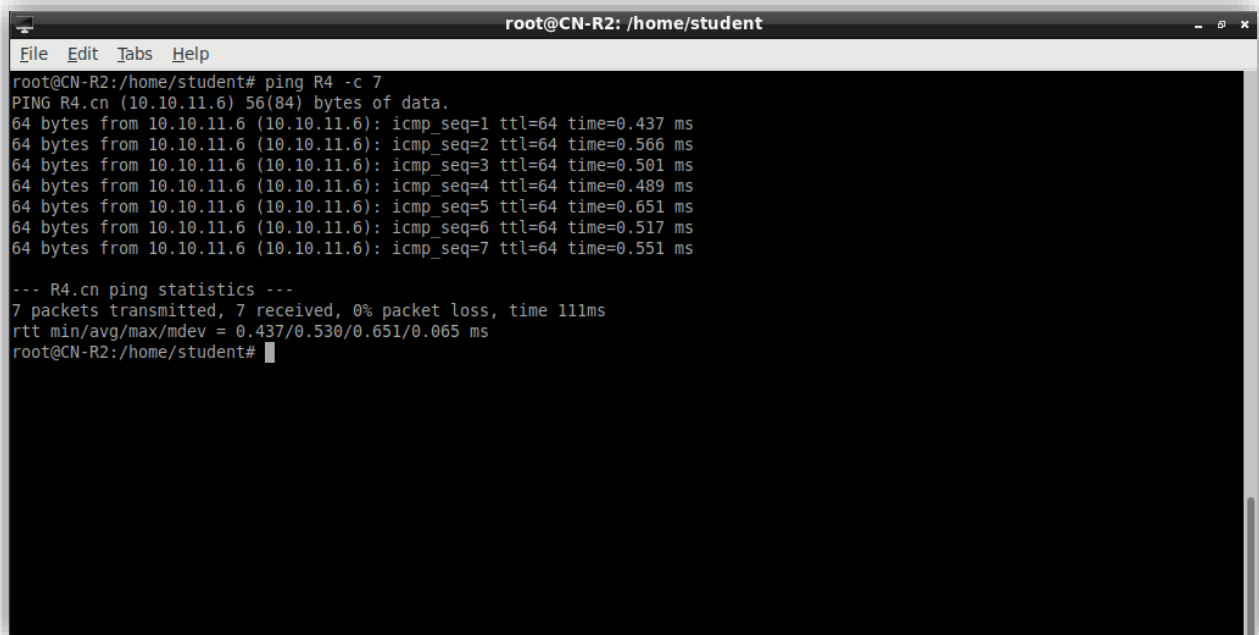
R2 pinging R3:

A terminal window titled 'root@CN-R2: /home/student' showing the output of a ping command to R3. The command is 'ping R3 -c 7'. The output shows 7 successful pings to 10.10.11.2 with varying response times. A summary line indicates 7 packets transmitted, 7 received, 0% packet loss, and a total time of 112ms.

```
root@CN-R2: /home/student
File Edit Tabs Help
root@CN-R2: /home/student# ping R3 -c 7
PING R3.cn (10.10.11.2) 56(84) bytes of data.
64 bytes from 10.10.11.2 (10.10.11.2): icmp_seq=1 ttl=64 time=0.270 ms
64 bytes from 10.10.11.2 (10.10.11.2): icmp_seq=2 ttl=64 time=0.279 ms
64 bytes from 10.10.11.2 (10.10.11.2): icmp_seq=3 ttl=64 time=0.187 ms
64 bytes from 10.10.11.2 (10.10.11.2): icmp_seq=4 ttl=64 time=0.381 ms
64 bytes from 10.10.11.2 (10.10.11.2): icmp_seq=5 ttl=64 time=0.513 ms
64 bytes from 10.10.11.2 (10.10.11.2): icmp_seq=6 ttl=64 time=0.504 ms
64 bytes from 10.10.11.2 (10.10.11.2): icmp_seq=7 ttl=64 time=0.459 ms

--- R3.cn ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 112ms
rtt min/avg/max/mdev = 0.187/0.370/0.513/0.119 ms
root@CN-R2: /home/student#
```

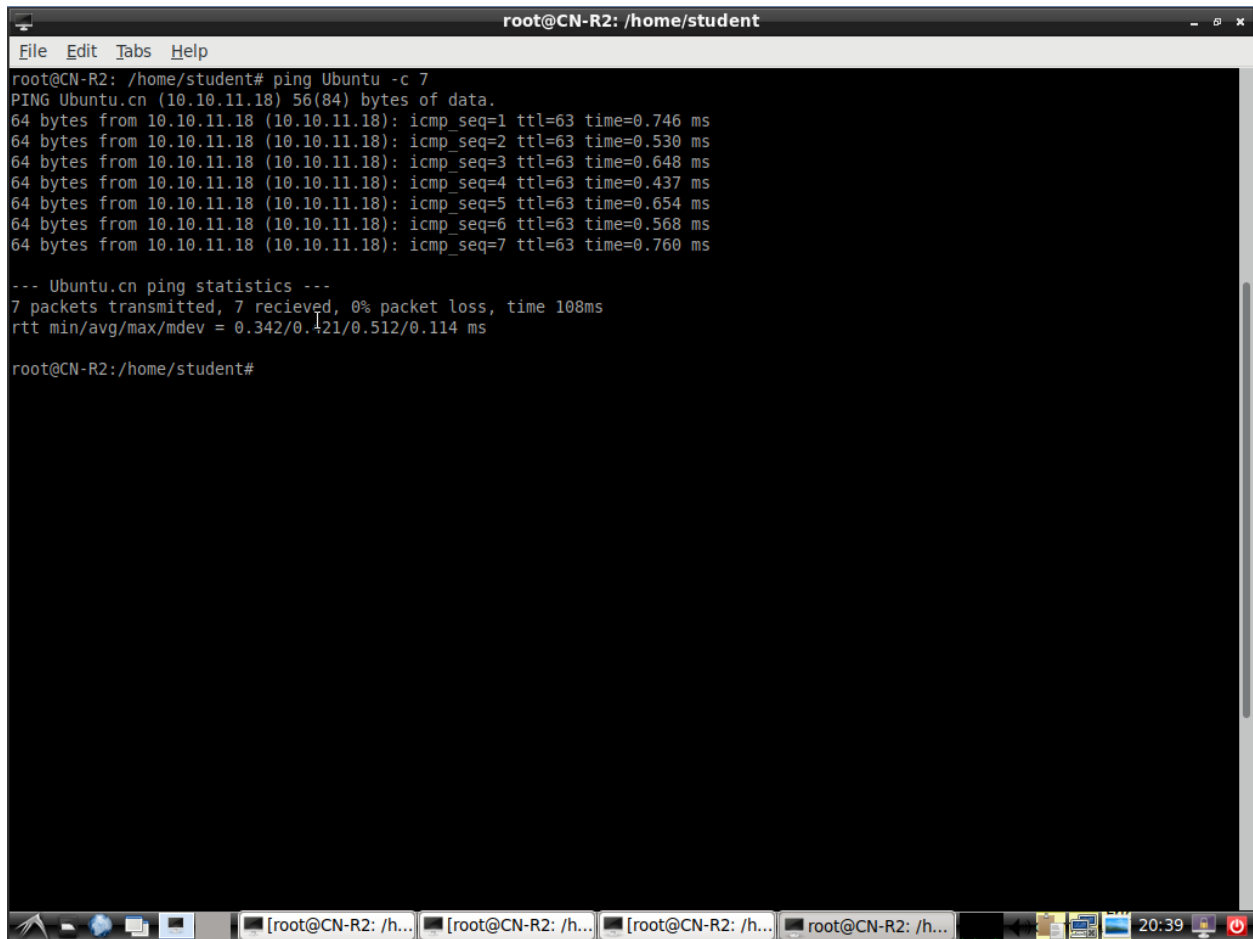
R2 pinging R4:

A terminal window titled 'root@CN-R2: /home/student' showing the output of a ping command to R4. The command is 'ping R4 -c 7'. The output shows 7 successful pings to 10.10.11.6 with varying response times. A summary line indicates 7 packets transmitted, 7 received, 0% packet loss, and a total time of 111ms.

```
root@CN-R2: /home/student
File Edit Tabs Help
root@CN-R2: /home/student# ping R4 -c 7
PING R4.cn (10.10.11.6) 56(84) bytes of data.
64 bytes from 10.10.11.6 (10.10.11.6): icmp_seq=1 ttl=64 time=0.437 ms
64 bytes from 10.10.11.6 (10.10.11.6): icmp_seq=2 ttl=64 time=0.566 ms
64 bytes from 10.10.11.6 (10.10.11.6): icmp_seq=3 ttl=64 time=0.501 ms
64 bytes from 10.10.11.6 (10.10.11.6): icmp_seq=4 ttl=64 time=0.489 ms
64 bytes from 10.10.11.6 (10.10.11.6): icmp_seq=5 ttl=64 time=0.651 ms
64 bytes from 10.10.11.6 (10.10.11.6): icmp_seq=6 ttl=64 time=0.517 ms
64 bytes from 10.10.11.6 (10.10.11.6): icmp_seq=7 ttl=64 time=0.551 ms

--- R4.cn ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 111ms
rtt min/avg/max/mdev = 0.437/0.530/0.651/0.065 ms
root@CN-R2: /home/student#
```

R2 pinging Ubuntu:



A terminal window titled "root@CN-R2: /home/student" showing the execution of a ping command. The command is "ping Ubuntu -c 7". The output shows seven successful ping requests to 10.10.11.18, each with a TTL of 63 and a response time between 0.437 ms and 0.760 ms. The statistics section indicates that 7 packets were transmitted and received with 0% packet loss and a total time of 108ms. The round-trip time (rtt) statistics are: min/avg/max/mdev = 0.342/0.421/0.512/0.114 ms.

```
root@CN-R2: /home/student# ping Ubuntu -c 7
PING Ubuntu.cn (10.10.11.18) 56(84) bytes of data:
64 bytes from 10.10.11.18 (10.10.11.18): icmp_seq=1 ttl=63 time=0.746 ms
64 bytes from 10.10.11.18 (10.10.11.18): icmp_seq=2 ttl=63 time=0.530 ms
64 bytes from 10.10.11.18 (10.10.11.18): icmp_seq=3 ttl=63 time=0.648 ms
64 bytes from 10.10.11.18 (10.10.11.18): icmp_seq=4 ttl=63 time=0.437 ms
64 bytes from 10.10.11.18 (10.10.11.18): icmp_seq=5 ttl=63 time=0.654 ms
64 bytes from 10.10.11.18 (10.10.11.18): icmp_seq=6 ttl=63 time=0.568 ms
64 bytes from 10.10.11.18 (10.10.11.18): icmp_seq=7 ttl=63 time=0.760 ms

--- Ubuntu.cn ping statistics ---
7 packets transmitted, 7 recieved, 0% packet loss, time 108ms
rtt min/avg/max/mdev = 0.342/0.421/0.512/0.114 ms

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