

Assignment 7

Domain Name Server (DNS)

By Ziming Song

zs2815@nyu.edu

Part 1: Setup DNS Resolution

R1

```
student@CN-R1:~$ cat /etc/resolv.conf
# Dynamic resolv.conf(5) file for glibc resolver(3) generated by resolvconf(8)
#     DO NOT EDIT THIS FILE BY HAND -- YOUR CHANGES WILL BE OVERWRITTEN
nameserver 10.10.11.1
domain cn.
search cn.
```

R2

```
student@CN-R2:~$ cat /etc/resolv.conf
# Dynamic resolv.conf(5) file for glibc resolver(3) generated by resolvconf(8)
#     DO NOT EDIT THIS FILE BY HAND -- YOUR CHANGES WILL BE OVERWRITTEN
nameserver 10.10.11.1
domain cn.
search cn.
student@CN-R2:~$
```

R3

```
student@CN-R3:~$ cat /etc/resolv.conf
# Dynamic resolv.conf(5) file for glibc resolver(3) generated by resolvconf(8)
#     DO NOT EDIT THIS FILE BY HAND -- YOUR CHANGES WILL BE OVERWRITTEN
nameserver 10.10.11.1
domain cn.
search cn.
student@CN-R3:~$
```

R4

```
student@CN-R4:~$ cat /etc/resolv.conf
# Dynamic resolv.conf(5) file for glibc resolver(3) generated by resolvconf(8)
#     DO NOT EDIT THIS FILE BY HAND -- YOUR CHANGES WILL BE OVERWRITTEN
nameserver 10.10.11.1
domain cn.
search cn.
student@CN-R4:~$
```

Ubuntu

```
student@Ubuntu:~$ cat /etc/resolv.conf
# Dynamic resolv.conf(5) file for glibc resolver(3) generated by resolvconf(8)
#     DO NOT EDIT THIS FILE BY HAND -- YOUR CHANGES WILL BE OVERWRITTEN
nameserver 10.10.11.1
domain cn.
search cn.
student@Ubuntu:~$
```

Kali

```
student@kali:~/Desktop$ cat /etc/resolv.conf
nameserver 10.10.11.1
domain cn.
search cn.
```

Part 2: Configuring the Primary Zone

a. Forward and Reverse zone files for primary DNS server. [20 points]

```
student@CN-R2:~$ cat /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";
};
student@CN-R2:~$
```

```
student@CN-R2:~$ cat /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       cn.
@         IN      A        127.0.0.1

R1        IN      A        10.10.10.1
R2        IN      A        10.10.11.1
R3        IN      A        10.10.11.9
R4        IN      A        10.10.11.6
Ubuntu    IN      A        10.10.11.18
Kali      IN      A        10.10.10.3
student@CN-R2:~$
```

```

student@CN-R2:~$ cat /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       cn.
@         IN      A        127.0.0.1

10.10.10.1 IN PTR R1.cn
10.10.11.1 IN PTR R2.cn
10.10.11.9 IN PTR R3.cn
10.10.11.6 IN PTR R4.cn
10.10.11.18 IN PTR Ubuntu.cn
10.10.10.3 IN PTR Kali.cn

```

b. Host lookup by name using nslookup or dig [15 points]

```

student@CN-R2:~$ dig Kali

; <<>> DiG 9.11.4-3ubuntu5.4-Ubuntu <<>> Kali
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: SERVFAIL, id: 37759
;; flags: qr rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 4096
;; COOKIE: 6f088714a4656bb5cd863d3165591c9f8e2569d77da61faa (good)
;; QUESTION SECTION:
;Kali.                                IN      A

;; Query time: 6 msec
;; SERVER: 10.10.11.1#53(10.10.11.1)
;; WHEN: Sat Nov 18 12:20:47 PST 2023
;; MSG SIZE rcvd: 61

```

```
student@CN-R2:~$ dig R3
```

```
; <<> DiG 9.11.4-3ubuntu5.4-Ubuntu <<> R3
;; global options: +cmd
;; Got answer:
;; ->HEADER<- opcode: QUERY, status: SERVFAIL, id: 30023
;; flags: qr rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
; COOKIE: da3f908eaa2cfef27fb2817d65591cad297b0808af64a532 (good)
;; QUESTION SECTION:
;R3.                                IN      A

;; Query time: 1418 msec
;; SERVER: 10.10.11.1#53(10.10.11.1)
;; WHEN: Sat Nov 18 12:21:01 PST 2023
;; MSG SIZE rcvd: 59
```

c. Host lookup by address using nslookup or dig [15 points]

```
student@CN-R2:~$ dig 10.10.10.3
```

```
; <<> DiG 9.11.4-3ubuntu5.4-Ubuntu <<> 10.10.10.3
;; global options: +cmd
;; Got answer:
;; ->HEADER<- opcode: QUERY, status: SERVFAIL, id: 34409
;; flags: qr rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
; COOKIE: 97db8e867e97e984d8192aa765591d41b6c5fc775b6001ee (good)
;; QUESTION SECTION:
;10.10.10.3.                        IN      A

;; Query time: 8 msec
;; SERVER: 10.10.11.1#53(10.10.11.1)
;; WHEN: Sat Nov 18 12:23:29 PST 2023
;; MSG SIZE rcvd: 67
```

```

student@CN-R2:~$ dig 10.10.11.9

; <<>> DiG 9.11.4-3ubuntu5.4-Ubuntu <<>> 10.10.11.9
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: SERVFAIL, id: 65181
;; flags: qr rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
; COOKIE: 9a88122b7deff7059bffa784165591d390c1c4ce55e8e6f80 (good)
;; QUESTION SECTION:
;10.10.11.9.                IN      A

;; Query time: 1556 msec
;; SERVER: 10.10.11.1#53(10.10.11.1)
;; WHEN: Sat Nov 18 12:23:21 PST 2023
;; MSG SIZE rcvd: 67

```

d. Screenshots of R1 pinging R2 and Kali [20 points]

```

student@CN-R1:~$ ping R2
PING R2.cn (10.10.11.1) 56(84) bytes of data.
64 bytes from 10.10.11.1 (10.10.11.1): icmp_seq=1 ttl=64 time=0.348 ms
64 bytes from 10.10.11.1 (10.10.11.1): icmp_seq=2 ttl=64 time=0.612 ms
64 bytes from 10.10.11.1 (10.10.11.1): icmp_seq=3 ttl=64 time=0.570 ms
64 bytes from 10.10.11.1 (10.10.11.1): icmp_seq=4 ttl=64 time=0.608 ms

```

```

student@CN-R1:~$ ping Kali
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=0.549 ms
64 bytes from 10.10.10.3 (10.10.10.3): icmp_seq=2 ttl=64 time=0.489 ms
64 bytes from 10.10.10.3 (10.10.10.3): icmp_seq=3 ttl=64 time=0.567 ms
64 bytes from 10.10.10.3 (10.10.10.3): icmp_seq=4 ttl=64 time=0.403 ms
64 bytes from 10.10.10.3 (10.10.10.3): icmp_seq=5 ttl=64 time=0.383 ms

```

e. Screenshots of R2 pinging R3, R4, and Ubuntu[30 points]

```

student@CN-R2:~$ ping R3
PING R3.cn (10.10.11.9) 56(84) bytes of data.
64 bytes from 10.10.11.9 (10.10.11.9): icmp_seq=1 ttl=64 time=0.675 ms
64 bytes from 10.10.11.9 (10.10.11.9): icmp_seq=2 ttl=64 time=0.522 ms
64 bytes from 10.10.11.9 (10.10.11.9): icmp_seq=3 ttl=64 time=0.590 ms
64 bytes from 10.10.11.9 (10.10.11.9): icmp_seq=4 ttl=64 time=0.525 ms

```

```

student@CN-R2:~$ ping R4
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=0.317 ms
64 bytes from 10.10.11.6 (10.10.11.6): icmp_seq=2 ttl=64 time=0.210 ms
64 bytes from 10.10.11.6 (10.10.11.6): icmp_seq=3 ttl=64 time=0.438 ms
64 bytes from 10.10.11.6 (10.10.11.6): icmp_seq=4 ttl=64 time=0.153 ms
64 bytes from 10.10.11.6 (10.10.11.6): icmp_seq=5 ttl=64 time=0.446 ms

```

```
student@CN-R2:~$ ping Ubuntu
PING Ubuntu.cn (10.10.11.18) 56(84) bytes of data.
64 bytes from 10.10.11.18: icmp_seq=1 ttl=64 time=0.336 ms
64 bytes from 10.10.11.18: icmp_seq=2 ttl=64 time=0.537 ms
64 bytes from 10.10.11.18: icmp_seq=3 ttl=64 time=0.408 ms
64 bytes from 10.10.11.18: icmp_seq=4 ttl=64 time=0.384 ms
64 bytes from 10.10.11.18: icmp_seq=5 ttl=64 time=0.357 ms
```