

Approx time to complete this assignment: 12 hours.

1. General DNS Configuration:

Configuration Files: Modified `/etc/named.conf` to define DNS server settings.

Basic Settings: Set up general configurations such as listen-on, directory, and logging parameters.

2. Views in BIND:

Internal View:

Utilized view statements to create separate views for internal and external clients.

Defined match-clients for the internal view to include specific IP ranges.

External View:

Configured an external view to match any client.

3. Split DNS Configuration:

Configured split DNS to provide different responses based on the client's network.

Internal responses included LAN-specific records, while external responses excluded them.

4. Zone Files:

Created distinct zone files for internal and external views.

Validated zone files using `named-checkzone`.

5. Reverse DNS:

Configured reverse DNS for the DMZ network within the external view.

6. DNS Security:

Implemented Access Control Lists (ACLs) like `allow-recursion` and `allow-transfer`.

7. Troubleshooting:

Checked DNS server logs (`/var/named/log/`) for errors and warnings.

Used tools like `named-checkconf` and `named-checkzone` for configuration and zone file validation.

8. Testing:

Utilized `dig` for DNS queries and responses.

Employed `tcpdump` to capture and analyze DNS traffic, helping to diagnose potential issues.

Machine B (Primary DNS Server) Configuration:

/etc/named.conf:

```
//
// named.conf
//
// Provided by Red Hat bind package to configure the ISC BIND named(8) DNS
// server as a caching only nameserver (as a localhost DNS resolver only).
//
// See /usr/share/doc/bind*/sample/ for example named configuration files.
//

options {
    listen-on port 53 { any; };
    directory      "/var/named";
    dump-file       "/var/named/data/cache_dump.db";
    statistics-file "/var/named/data/named_stats.txt";
    memstatistics-file "/var/named/data/named_mem_stats.txt";
    recursion yes;
    allow-transfer { 100.64.26.6; };
};

view "internal" {
    match-clients { 10.21.32.0/24; 100.64.26.0/24; };
    allow-recursion { 10.21.32.0/24; 100.64.26.0/24; };
    recursion yes;

    zone "dundermifflin.com" {
        type primary;
        file "/var/named/dundermifflin.com.internal.zone";
    };

    zone "32.21.10.in-addr.arpa" {
        type primary;
        file "/var/named/32.21.10.zone";
    };

    zone "26.64.100.in-addr.arpa" {
```

```
    type primary;
    file "/var/named/26.64.100.zone";
};

view "external" {
    match-clients { !10.21.32.0/24; !100.64.26.0/24; any; };
    recursion no;

    zone "dundermifflin.com" {
        type primary;
        file "/var/named/dundermifflin.com.external.zone";
    };

    zone "26.64.100.in-addr.arpa" {
        type primary;
        file "/var/named/26.64.100.zone";
    };
};

logging {
    channel default_debug {
        file "/var/named/log/debug.log";
        severity dynamic;
    };
    category notify { zone_transfer_log; };
    category xfer-in { zone_transfer_log; };
    category xfer-out { zone_transfer_log; };
    channel zone_transfer_log {
        file "/var/named/log/transfer.log" versions 10 size 50m;
        print-time yes;
        print-category yes;
        print-severity yes;
        severity info;
    };
};
```

26.64.100.zone

```
[root@dns0 named]# cat 26.64.100.zone
```

```
$TTL 1h
```

```
@      IN      SOA    dns0.dundermifflin.com. snir8112.colorado.com. (  
      20231111      ; Serial  
      1d           ; Refresh  
      1h           ; Retry  
      1w           ; Expire  
      1h )         ; Negative Cache TTL
```

```
@      IN      NS     dns0.dundermifflin.com.  
      IN      NS     dns1.dundermifflin.com.
```

```
1      IN      PTR     dmz.dundermifflin.com.  
2      IN      PTR     dns0.dundermifflin.com.  
3      IN      PTR     web0.dundermifflin.com.  
4      IN      PTR     web1.dundermifflin.com.  
6      IN      PTR     dns1.dundermifflin.com.  
7      IN      PTR     bsd.dundermifflin.com.
```

```
[root@dns0 named]# cat 32.21.10.zone
```

```
$TTL 1h
```

```
@      IN      SOA    dns0.dundermifflin.com. snir8112.colorado.edu. (  
      20231111      ; Serial  
      1d           ; Refresh  
      1h           ; Retry  
      1w           ; Expire  
      1h )         ; Negative Cache TTL
```

```
@      IN      NS     dns0.dundermifflin.com.  
      IN      NS     dns1.dundermifflin.com.
```

```
1      IN      PTR     lan.dundermifflin.com.  
2      IN      PTR     nfs.dundermifflin.com.
```

```
[root@dns0 named]# cat dundermifflin.com.internal.zone
```

```
$TTL 1h
```

```
@      IN      SOA    dns0.dundermifflin.com. snir8112.colorado.edu. (  
      20231111      ; Serial  
      1d      ; Refresh  
      1h      ; Retry  
      1w      ; Expire  
      1h )      ; Negative Cache TTL
```

```
@      IN      NS     dns0.dundermifflin.com.  
      IN      NS     dns1.dundermifflin.com.  
      5m IN      A      100.64.26.3
```

```
dns0   IN      A      100.64.26.2
```

```
dns1   IN      A      100.64.26.6
```

```
router      IN      A      100.64.0.26
```

```
dmz         IN      A      100.64.26.1
```

```
dns0        IN      A      100.64.26.2
```

```
web0        IN      A      100.64.26.3
```

```
web1        IN      A      100.64.26.4
```

```
lan         IN      A      10.21.32.1
```

```
nfs         IN      A      10.21.32.2
```

```
dns1        IN      A      100.64.26.6
```

```
bsd         IN      A      100.64.26.7
```

```
machinea 7d IN      CNAME  router.dundermifflin.com.
```

```
machineb 7d IN      CNAME  dns0.dundermifflin.com.
```

```
machinec 7d IN      CNAME  web0.dundermifflin.com.
```

```
machined 7d IN      CNAME  web1.dundermifflin.com.
```

```
machinef 7d IN      CNAME  dns1.dundermifflin.com.
```

```
machinex 7d IN      CNAME  bsd.dundermifflin.com.
```

```
machinee 7d IN      CNAME  nfs.dundermifflin.com.
```

```
files 7d IN CNAME  nfs.dundermifflin.com.
```

```
www 5m IN CNAME  web0.dundermifflin.com.
```

```
www1 5m IN CNAME  web1.dundermifflin.com.
```

```
dns 5m IN CNAME  dns0.dundermifflin.com.
```

```

[root@dns0 named]# cat dundermifflin.com.external.zone
$TTL 1h
@      IN      SOA    dns0.dundermifflin.com. snir8112.colorado.edu. (
      20231111      ; Serial
      1d           ; Refresh
      1h           ; Retry
      1w           ; Expire
      1h )         ; Negative Cache TTL

@      IN      NS     dns0.dundermifflin.com.
      IN      NS     dns1.dundermifflin.com.
      5m IN      A      100.64.26.3

dns0   IN      A      100.64.26.2
dns1   IN      A      100.64.26.6

router      IN      A      100.64.0.26
dmz         IN      A      100.64.26.1
dns0        IN      A      100.64.26.2
web0        IN      A      100.64.26.3
web1        IN      A      100.64.26.4
dns1        IN      A      100.64.26.6
bsd         IN      A      100.64.26.7

machinea 7d IN      CNAME  router.dundermifflin.com.
machineb 7d IN      CNAME  dns0.dundermifflin.com.
machinec 7d IN      CNAME  web0.dundermifflin.com.
machined 7d IN      CNAME  web1.dundermifflin.com.
machinef 7d IN      CNAME  dns1.dundermifflin.com.
machinex 7d IN      CNAME  bsd.dundermifflin.com.

www      5m IN CNAME  web0.dundermifflin.com.
www1     5m IN CNAME  web1.dundermifflin.com.
dns      5m IN CNAME  dns0.dundermifflin.com.

```

Machine F (Secondary DNS Server) Configuration

```
root@dns1:/etc/bind# cat named.conf.options
```

```
options {

    // If there is a firewall between you and nameservers you want
    // to talk to, you may need to fix the firewall to allow multiple
    // ports to talk. See http://www.kb.cert.org/vuls/id/800113

    // If your ISP provided one or more IP addresses for stable
    // nameservers, you probably want to use them as forwarders.
    // Uncomment the following block, and insert the addresses replacing
    // the all-0's placeholder.

    // forwarders {
    //     0.0.0.0;
    // };

    //=====

    // If BIND logs error messages about the root key being expired,
    // you will need to update your keys. See https://www.isc.org/bind-keys

    //=====

    dnssec-validation auto;
    listen-on-v6 { any; };
    listen-on port 53 { any; };
    directory "/etc/bind";
    dump-file "/etc/bind/data/cache_dump.db";
    statistics-file "/etc/bind/data/named_stats.txt";
    memstatistics-file "/etc/bind/data/named_mem_stats.txt";
};

view "internal" {
    match-clients { 10.21.32.0/24; 100.64.26.0/24; };
    allow-recursion { 10.21.32.0/24; 100.64.26.0/24; };
    recursion yes;

    zone "dundermifflin.com" {
        type secondary;
```

```
file "/etc/bind/dundermifflin.com.internal.zone";
primaries { 100.64.26.2; };
};

zone "32.21.10.in-addr.arpa" {
type secondary;
file "/etc/bind/32.21.10.zone";
primaries { 100.64.26.2; };
};

zone "26.64.100.in-addr.arpa" {
type secondary;
file "/etc/bind/26.64.100.internal.zone";
primaries { 100.64.26.2; };
};
};

view "external" {
match-clients { !10.21.32.0/24; !100.64.26.0/24; any; };
recursion no;

zone "dundermifflin.com" {
type secondary;
file "/etc/bind/dundermifflin.com.external.zone";
primaries { 100.64.26.2; };
};

zone "26.64.100.in-addr.arpa" {
type secondary;
file "/etc/bind/26.64.100.external.zone";
primaries { 100.64.26.2; };
};
};
```

```
root@dns1:/etc/bind# cat 26.64.100.internal.zone
$TTL 1h
```



```

@      IN      SOA    dns0.dundermifflin.com. snir8112.colorado.com. (
20231111      ; Serial
1d      ; Refresh
1h      ; Retry
1w      ; Expire
1h )      ; Negative Cache TTL

@      IN      NS     dns0.dundermifflin.com.
      IN      NS     dns1.dundermifflin.com.

1      IN      PTR    dmz.dundermifflin.com.
2      IN      PTR    dns0.dundermifflin.com.
3      IN      PTR    web0.dundermifflin.com.
4      IN      PTR    web1.dundermifflin.com.
6      IN      PTR    dns1.dundermifflin.com.
7      IN      PTR    bsd.dundermifflin.com.

```

```

root@dns1:/etc/bind# cat 26.64.100.external.zone

```

```

$TTL 1h

```

```

@      IN      SOA    dns0.dundermifflin.com. snir8112.colorado.com. (
20231111      ; Serial
1d      ; Refresh
1h      ; Retry
1w      ; Expire
1h )      ; Negative Cache TTL

@      IN      NS     dns0.dundermifflin.com.
      IN      NS     dns1.dundermifflin.com.

1      IN      PTR    dmz.dundermifflin.com.
2      IN      PTR    dns0.dundermifflin.com.
3      IN      PTR    web0.dundermifflin.com.
4      IN      PTR    web1.dundermifflin.com.
6      IN      PTR    dns1.dundermifflin.com.
7      IN      PTR    bsd.dundermifflin.com.

```

```
root@dns1:/etc/bind# cat dundermifflin.com.internal.zone
```

```
$TTL 1h
```

```
@      IN      SOA    dns1.dundermifflin.com. snir8112.colorado.edu. (  
      20231111      ; Serial  
      1d      ; Refresh  
      1h      ; Retry  
      1w      ; Expire  
      1h )      ; Negative Cache TTL
```

```
@      IN      NS     dns1.dundermifflin.com.  
      IN      NS     dns0.dundermifflin.com.  
      5m IN      A      100.64.26.3
```

```
router      IN      A      100.64.0.26  
dmz          IN      A      100.64.26.1  
dns0         IN      A      100.64.26.2  
web0         IN      A      100.64.26.3  
web1         IN      A      100.64.26.4  
lan      IN      A      10.21.32.1  
nfs      IN      A      10.21.32.2  
dns1      IN      A      100.64.26.6  
bsd       IN      A      100.64.26.7
```

```
machinea 7d IN      CNAME  router.dundermifflin.com.  
machineb 7d IN      CNAME  dns0.dundermifflin.com.  
machinec 7d IN      CNAME  web0.dundermifflin.com.  
machined 7d IN      CNAME  web1.dundermifflin.com.  
machinef 7d IN      CNAME  dns1.dundermifflin.com.  
machinex 7d IN      CNAME  bsd.dundermifflin.com.  
machinee 7d IN      CNAME  nfs.dundermifflin.com.
```

```
files 7d IN CNAME  nfs.dundermifflin.com.  
www    5m IN CNAME  web0.dundermifflin.com.  
www1   5m IN CNAME  web1.dundermifflin.com.  
dns    5m IN CNAME  dns0.dundermifflin.com.
```

```
root@dns1:/etc/bind# cat dundermifflin.com.external.zone
```

```
$TTL 1h
```

```
@      IN      SOA    dns1.dundermifflin.com. snir8112.colorado.edu. (  
      20231111      ; Serial  
      1d      ; Refresh  
      1h      ; Retry  
      1w      ; Expire  
      1h )      ; Negative Cache TTL
```

```
@      IN      NS     dns1.dundermifflin.com.  
      IN      NS     dns0.dundermifflin.com.  
      5m IN      A      100.64.26.3
```

```
router      IN      A      100.64.0.26  
dmz          IN      A      100.64.26.1  
dns0         IN      A      100.64.26.2  
web0         IN      A      100.64.26.3  
web1         IN      A      100.64.26.4  
dns1  IN      A      100.64.26.6  
bsd   IN      A      100.64.26.7
```

```
machinea 7d IN      CNAME  router.dundermifflin.com.  
machineb 7d IN      CNAME  dns0.dundermifflin.com.  
machinec 7d IN      CNAME  web0.dundermifflin.com.  
machined 7d IN      CNAME  web1.dundermifflin.com.  
machinef 7d IN      CNAME  dns1.dundermifflin.com.  
machinex 7d IN      CNAME  bsd.dundermifflin.com.
```

```
www  5m IN CNAME  web0.dundermifflin.com.  
www1 5m IN CNAME  web1.dundermifflin.com.  
dns   5m IN CNAME  dns0.dundermifflin.com.
```