

# CSCI4113

## LAB5 B Notes

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### 1. Configuring rsync between machines B and F

Rsync has to be installed on both machines B and F:

```
1 [root@carriage ~]# yum install rsync
```

Then the user group permissions and DM site are pulled from machine B to machine F:

```
1 [root@saddle ~]# rsync -avz root@carriage:/etc/sudoers /etc/sudoers
2 [root@saddle ~]# rsync -avz root@carriage:/etc/shadow /etc/shadow
3 [root@saddle ~]# rsync -avz root@carriage:/etc/passwd /etc/passwd
4 [root@saddle ~]# rsync -avz root@carriage:/etc/group /etc/group
5 [root@saddle ~]# rsync -avz root@carriage:/var/www/ /var/www/
```

To schedule the DM site to get pulled from machine B to F a crontab rule is set up:

```
1 [root@saddle ~]# nano /etc/crontab
2 File: /etc/crontab
3 SHELL=/bin/bash
4 PATH=/sbin:/bin:/usr/sbin:/usr/bin
5 MAILTO=root
6 # For details see man 4 crontabs
7 # Example of job definition:
8 # .----- minute (0 - 59)
9 # | .----- hour (0 - 23)
10 # | | .----- day of month (1 - 31)
11 # | | | .----- month (1 - 12) OR jan,feb,mar,apr ...
12 # | | | | .----- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,$
13 # | | | | |
14 # * * * * * user-name command to be executed
15 0 * * * * root rsync -avz root@carriage:/var/www/ /var/www/
16 [root@saddle ~]# systemctl restart crond
17 [root@saddle ~]# systemctl enable crond
```

The crond daemon is then restarted and enabled.

### 2. Configuring machine D as the DNS server

To Configure Machine D as the DNS server Bind is installed with:

```
1 [root@chase ~]# yum install bind bind-utils
```

After that 3 config files have to be set up:

```
1 [root@chase ~]# nano /etc/named.conf
```

The named.conf file sets up the basic configuration for the Named daemon. It's important to set recursion to yes and set up the dundermifflin.com zone correctly.

```

1 File: /etc/named.conf
2 options {
3     directory "/var/named";
4     recursion yes;
5     listen-on {127.0.0.1; 100.64.21.0/24; 10.32.21.2/24;};
6     allow-query{any;};
7 };
8
9 zone "dundermifflin.com" {
10     type master;
11     file "dundermifflin.com.";
12 };
13 [root@chase ~]# chmod 777 /etc/named.conf

```

Next is the dundermifflin.com. config for the dundermifflin zone:

```

1 [root@chase ~]# nano /var/named/dundermifflin.com.
2 File: /var/named/dundermifflin.com.
3 $TTL 1H
4 ; any time you make a change to the domain, bump the
5 ; "serial" setting below. the format is easy:
6 ; YYYYMMDDI, with the I being an iterator in case you
7 ; make more than one change during any one day
8 @      IN SOA      chase      hostmaster (
9         200405191 ; serial
10        8H        ; refresh
11        4H        ; retry
12        4W        ; expire
13        1D )      ; minimum
14 ; chase.dundermifflin.com serves this domain as both the
15 ; name server (NS) and mail exchange (MX)
16        NS        chase.dundermifflin.com.
17        MX        10 chase
18 ; define domain functions with CNAMEs
19 dundermifflin.com.      300      IN      CNAME      carriage.dundermifflin.com
20 www.dundermifflin.com.  300      IN      CNAME      carriage.dundermifflin.com
21 www2.dundermifflin.com. 300      IN      CNAME      saddle.dundermifflin.com.
22 ftp.dundermifflin.com.  300      IN      CNAME      platen.dundermifflin.com.
23 files.dundermifflin.com. 604800 IN      CNAME      roller.dundermifflin.com.
24
25 machinea.dundermifflin.com. 604800 IN      CNAME      router.dundermifflin.com.
26 machineb.dundermifflin.com. 604800 IN      CNAME      carriage.dundermifflin.com.
27 machinec.dundermifflin.com. 604800 IN      CNAME      platen.dundermifflin.com.
28 machined.dundermifflin.com. 604800 IN      CNAME      chase.dundermifflin.com.
29 machinee.dundermifflin.com. 604800 IN      CNAME      roller.dundermifflin.com.
30 machinef.dundermifflin.com. 604800 IN      CNAME      saddle.dundermifflin.com.
31
32
33 ; just in case someone asks for localhost.schroder.net
34 localhost      IN      A      127.0.0.1
35 ; our hostnames, in alphabetical order
36 router.dundermifflin.com. IN      A      100.64.0.21
37 carriage.dundermifflin.com. IN      A      100.64.21.2
38 platen.dundermifflin.com. IN      A      100.64.21.3
39 chase.dundermifflin.com.  IN      A      100.64.21.4
40 roller.dundermifflin.com. IN      A      100.21.32.2
41 saddle.dundermifflin.com. IN      A      100.64.21.5
42 [root@chase ~]# chmod 777 /var/named/dundermifflin.com.

```

This file contains the ip bindings for the local dundermifflin.com domain as well as set chase as the Name Server for the network.

Last is the named.ca file containing information on DNS servers resolving domains not dundermifflin.com. This file can be downloaded from <https://www.internic.net/domain/named.root>.

```

1 [root@chase ~]# nano /var/named/named.ca
2 File: /var/named/named.ca
3 ;
4 ; This file holds the information on root name servers needed to
5 ; initialize cache of Internet domain name servers
6 ; (e.g. reference this file in the "cache . <file>"
7 ; configuration file of BIND domain name servers).
8 ;
9 ; This file is made available by InterNIC
10 ; under anonymous FTP as
11 ; file /domain/named.cache
12 ; on server FTP.INTERNIC.NET
13 ; -OR- RS.INTERNIC.NET

```

```

13 | ;
14 |         last update:      March 13, 2019
15 |         related version of root zone:      2019031302
16 | ;
17 | ; FORMERLY NS.INTERNIC.NET
18 | ;
19 | .                 3600000      NS      A.ROOT-SERVERS.NET.
20 | A.ROOT-SERVERS.NET. 3600000      A      198.41.0.4
21 | A.ROOT-SERVERS.NET. 3600000      AAAA   2001:503:ba3e::2:30
22 | ;
23 | ; FORMERLY NS1.ISI.EDU
24 | ;
25 | .                 3600000      NS      B.ROOT-SERVERS.NET.
26 | B.ROOT-SERVERS.NET. 3600000      A      199.9.14.201
27 | B.ROOT-SERVERS.NET. 3600000      AAAA   2001:500:200::b
28 | ;
29 | ; FORMERLY C.PSI.NET
30 | ;
31 | .                 3600000      NS      C.ROOT-SERVERS.NET.
32 | C.ROOT-SERVERS.NET. 3600000      A      192.33.4.12
33 | C.ROOT-SERVERS.NET. 3600000      AAAA   2001:500:2::c
34 | ;
35 | ; FORMERLY TERP.UMD.EDU
36 | ;
37 | .                 3600000      NS      D.ROOT-SERVERS.NET.
38 | D.ROOT-SERVERS.NET. 3600000      A      199.7.91.13
39 | D.ROOT-SERVERS.NET. 3600000      AAAA   2001:500:2d::d
40 | ;
41 | ; FORMERLY NS.NASA.GOV
42 | ;
43 | .                 3600000      NS      E.ROOT-SERVERS.NET.
44 | E.ROOT-SERVERS.NET. 3600000      A      192.203.230.10
45 | E.ROOT-SERVERS.NET. 3600000      AAAA   2001:500:a8::e
46 | ;
47 | ; FORMERLY NS.ISC.ORG
48 | ;
49 | .                 3600000      NS      F.ROOT-SERVERS.NET.
50 | F.ROOT-SERVERS.NET. 3600000      A      192.5.5.241
51 | F.ROOT-SERVERS.NET. 3600000      AAAA   2001:500:2f::f
52 | ;
53 | ; FORMERLY NS.NIC.DDN.MIL
54 | ;
55 | .                 3600000      NS      G.ROOT-SERVERS.NET.
56 | G.ROOT-SERVERS.NET. 3600000      A      192.112.36.4
57 | G.ROOT-SERVERS.NET. 3600000      AAAA   2001:500:12::d0d
58 | ;
59 | ; FORMERLY AOS.ARL.ARMY.MIL
60 | ;
61 | .                 3600000      NS      H.ROOT-SERVERS.NET.
62 | H.ROOT-SERVERS.NET. 3600000      A      198.97.190.53
63 | [root@chase ~]# chmod 777 /var/named/named.ca

```

After this is done the Named demon has to be started and enabled to run on boot:

```

1 | [root@chase ~]# systemctl start named
2 | [root@chase ~]# systemctl enable named

```

### 3. Configuring machine A the Router

Machine A has to be configured to advertise Machine D as the DNS sever for the local network. This is done by adding the line: option domain-name-servers 100.64.21.4; To both of the subnets served by the router.

```

1 | [root@router ~]# nano /etc/dhcp/dhcpd.conf

```

After this is complete the dhcpd daemon has to be restarted for the new configuration to take effect.

The DNS server is set statically in the router by removing the line PEERDNS=no and adding the line DNS1=100.64.21.4 the 3 network interface config files:

```

1 [root@router ~]# nano /etc/sysconfig/network-scripts/ifcfg-ens256
2 [root@router ~]# nano /etc/sysconfig/network-scripts/ifcfg-ens224
3 [root@router ~]# nano /etc/sysconfig/network-scripts/ifcfg-ens192

```

Note the university DNS server at 128.138.130.30 is still kept as a backup.

#### 4. Configuring machines B,C,D,E,F to accept the new DNS Server

Machines B,C,D,E and F need to be configured to take the new address of the local DNS server from DHCP. This is done by the removing the line PEERDNS=no and adding the lines DNS1="" and DNS2="" to the network interface config file on all the above mentioned machines:

```

1 [root@router ~]# nano /etc/sysconfig/network-scripts/ifcfg-ens192

```

For some reason without forcing the 2 DNS servers to be empty the machines would revert to the University DNS after reboot.

To check if the setting stuck the resolv.conf file is checked and a dig is performed on both an external and internal domain:

```

1 [root@carriage ~]# nano /etc/resolv.conf
2 File: /etc/resolv.conf
3 ; generated by /usr/sbin/dhclient-script
4 search dundermifflin.com.
5 nameserver 100.64.21.4
6 [root@carriage ~]# dig dundermifflin.com
7 ; <<>> DiG 9.9.4-RedHat-9.9.4-73.el7_6 <<>> dundermifflin.com
8 ;; global options: +cmd
9 ;; Got answer:
10 ;; ->HEADER<<- opcode: QUERY, status: NOERROR, id: 39724
11 ;; flags: qr aa rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 1
12 ;; OPT PSEUDOSECTION:
13 ; EDNS: version: 0, flags:; udp: 4096
14 ;; QUESTION SECTION:
15 ;dundermifflin.com.                IN      A
16 ;; AUTHORITY SECTION:
17 dundermifflin.com.                3600    IN      SOA     chase.dundermifflin.com. hostmaster.dundermifflin.com. 200405191
18                               28800 14400 2419200 86400
19 ;; Query time: 1 msec
20 ;; SERVER: 100.64.21.4#53(100.64.21.4)
21 ;; WHEN: Tue Apr 09 01:00:44 MDT 2019
22 ;; MSG SIZE rcvd: 99
23 [root@carriage ~]# dig www.google.com
24 ; <<>> DiG 9.9.4-RedHat-9.9.4-73.el7_6 <<>> www.google.com
25 ;; global options: +cmd
26 ;; Got answer:
27 ;; ->HEADER<<- opcode: QUERY, status: NOERROR, id: 14187
28 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 4, ADDITIONAL: 9
29 ;; OPT PSEUDOSECTION:
30 ; EDNS: version: 0, flags:; udp: 4096
31 ;; QUESTION SECTION:
32 ;www.google.com.                  IN      A
33 ;; ANSWER SECTION:
34 www.google.com.                  300     IN      A       172.217.2.4
35 ;; AUTHORITY SECTION:
36 google.com.                     171975  IN      NS      ns3.google.com.
37 google.com.                     171975  IN      NS      ns2.google.com.
38 google.com.                     171975  IN      NS      ns4.google.com.
39 google.com.                     171975  IN      NS      ns1.google.com.
40 ;; ADDITIONAL SECTION:
41 ns2.google.com.                 171975  IN      A       216.239.34.10
42 ns2.google.com.                 171975  IN      AAAA    2001:4860:4802:34::a
43 ns1.google.com.                 171975  IN      A       216.239.32.10
44 ns1.google.com.                 171975  IN      AAAA    2001:4860:4802:32::a
45 ns3.google.com.                 171975  IN      A       216.239.36.10
46 ns3.google.com.                 171975  IN      AAAA    2001:4860:4802:36::a
47 ns4.google.com.                 171975  IN      A       216.239.38.10
48 ns4.google.com.                 171975  IN      AAAA    2001:4860:4802:38::a
49 ;; Query time: 26 msec
50 ;; SERVER: 100.64.21.4#53(100.64.21.4)

```

```
50 |;; WHEN: Tue Apr 09 01:01:52 MDT 2019
51 |;; MSG SIZE rcvd: 307
```

Towards the end of the Dig output on the SERVER: line you can see the domains resolve to our local DNS server at 100.64.21.4.