Politeknik Elektronika Negeri Surabaya

Workshop
Domain Name System

Oleh:

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Instalasi DNS

- # apt install bind9 dnsutils

```
root@vlab-os301:/home/student# apt install bind9 dnsutils
Reading package lists... Done
Building dependency tree
Reading state information... Done
dnsutils is already the newest version (1:9.11.5.P4+dfsg-5.1+deb10u5).
The following additional packages will be installed:
  bind9utils dns-root-data python3-ply
Suggested packages:
  bind9-doc resolvconf ufw python-ply-doc
The following NEW packages will be installed:
  bind9 bind9utils dns-root-data python3-ply
0 upgraded, 4 newly installed, 0 to remove and 45 not upgraded.
Need to get 1137 kB of archives.
After this operation, 4121 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Menambahkan zone/domain

- Misal domain yang kita gunakan adalah: **contoh.com**

  # vim /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 "contoh.com" {
        type master;
        file "/var/cache/bind/contoh.com.db";
};
```

Membuat Record Resource

- Mengcopy file db.local

  # cp /etc/bind/db.local /var/cache/bind/contoh.com.db

- Edit file contoh.com.db

  # vim /var/cache/bind/contoh.com.db

```
;
; BIND data file for local loopback interface
;
$TTL    604800
@       IN      SOA     contoh.com. root.contoh.com. (
                              2         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      contoh.com.
@       IN      A       10.252.108.101
@       IN      AAAA    ::1
www     IN      A       10.252.108.102
```

Mengkonfigurasi opsi tambahan (forwarders)

- Edit file named.conf.options

  # vim /etc/bind/named.conf.options

```
options {
        directory "/var/cache/bind";

        // 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 {
                202.9.85.4;
                8.8.8.8;
        };

        //
```

Edit file konfigurasi DNS client

- Edit file resolv.conf

  # vim /etc/resolv.conf

```
search pens.ac.id
nameserver 127.0.0.1
```

Restart dan uji coba layanan

- Restart

  # systemctl restart bind9.service

- Uji coba

  # nslookup contoh.com

```
root@vlab-os332:/home/student# nslookup contoh.com
Server:         127.0.0.1
Address:        127.0.0.1#53

Name:   contoh.com
Address: 10.252.108.101
Name:   contoh.com
Address: ::1
```

```
root@vlab-os332:/home/student# nslookup
> server 127.0.0.1
Default server: 127.0.0.1
Address: 127.0.0.1#53
> contoh.com
Server:         127.0.0.1
Address:        127.0.0.1#53

Name:   contoh.com
Address: 10.252.108.101
Name:   contoh.com
Address: ::1
```

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Slave DNS

Master: konfigurasi file named.conf.local

- Skenario:
  - IP Addr untuk master DNS: 10.252.216.132
  - IP Addr untuk slave DNS: 10.252.216.131

- Edit file named.conf.local untuk notifikasi ke *slave*

  # vim /etc/bind/named.conf.local

```
zone "contoh.com" {
        type master;
        file "/var/cache/bind/contoh.com.db";
        also-notify { 10.252.216.131; };
        notify yes;
};
```

Slave: konfigurasi file named.conf.local

- Asumsi aplikasi bind9 dan dnsutils sudah terinstal.
- Edit file named.conf.local

  # vim /etc/bind/named.conf.local

```
zone "contoh.com" {
        type slave;
        file "/var/cache/bind/contoh.com.slave.db";
        masters { 10.252.216.132; };
        allow-transfer { 10.252.216.132; };
};
```

Restart dan uji coba

- Restart bind9 pada mesin master dan slave

  # systemctl restart bind9.service

- Uji coba pada komputer slave

  # ls -l /var/cache/bind/contoh.com.slave.db

```
root@vlab-os331:/home/student# ls -l /var/cache/bind/contoh.com.slave.db
-rw-r--r-- 1 bind bind 283 Oct  3 19:55 /var/cache/bind/contoh.com.slave.db
root@vlab-os331:/home/student# nslookup
> server 127.0.0.1
Default server: 127.0.0.1
Address: 127.0.0.1#53
> contoh.com
Server:         127.0.0.1
Address:        127.0.0.1#53

Name:   contoh.com
Address: 10.252.108.101
Name:   contoh.com
Address: ::1
```

Tambahan

- Setiap kali terdapat perubahan pada RR di master, hendaknya serial harus diubah nilainya *(increment)* agar slave dapat mengetahui terdapat pembaharuan data.
- Opsi *allow-recursion* harus di konfigurasi hanya diperuntukkan bagi server/mesin *slave* saja guna tidak disalah gunakan oleh pihak yang tidak bertanggung jawab.

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DDNS

Prasyarat

- Paket/layanan DHCP Server telah terinstall
  - # apt install isc-dhcp-server

Konfigurasi DNS/Bind

- Tambahkan script di bawah ini pada file /etc/bind/named.conf.local
- Restart layanan DNS/bind9

```
include "/etc/bind/rndc.key";
controls{
        inet 127.0.0.1 port 953
        allow {
                127.0.0.1;
        }keys { "rndc-key"; };
};

zone "contoh.org" {
        type master;
        file "contoh.com.db";
        notify yes;
        allow-update {
                127.0.0.1;
                key "rndc-key";
        };
};
```

- Catatan: untuk file rndc.key bisa dibuat dengan cara:

  # tsig-keygen -a hmac-sha256 <nama-key>

Konfigurasi DHCP

- Tambahkan script di bawah ini pada file /etc/dhcp/dhcpd.conf pada awal baris
- Restart layanan DHCP

```
ddns-updates    on;
ddns-update-style interim;
ddns-domainname "idris.org";
include "/etc/bind/rndc.key";


zone idris.org {
        primary 127.0.0.1;
        key rndc-key;
}
```

Uji coba

- Pastikan PC di client ada pada file /etc/dhcp/dhclient.conf terdapat opsi **send host-name = gethostname();**
- DDNS berhasil dengan ditandai terbentuknya file .jnl

```
-rw-r--r-- 1 bind bind 394 Apr 28 19:35 contoh.com.db
-rw-r--r-- 1 bind bind 775 Apr 28 19:23 contoh.com.db.jnl
-rw-r--r-- 1 bind bind 297 Apr 28 19:11 managed-keys.bind
-rw-r--r-- 1 bind bind 785 Apr 28 19:11 managed-keys.bind.jnl
```

- Pada /var/log/syslog ditandai dengan "Added new forward map ...."

```
Apr 28 19:23:22 localhost dhcpd[4534]: DHCPOFFER on 192.168.1.100 to 00:0c:29:73:93:c9 (debian) via ens224
Apr 28 19:23:22 localhost dhcpd[4534]: DHCPREQUEST for 192.168.1.100 (192.168.1.1) from 00:0c:29:73:93:c9 (debian) via e
ns224
Apr 28 19:23:22 localhost dhcpd[4534]: DHCPACK on 192.168.1.100 to 00:0c:29:73:93:c9 (debian) via ens224
Apr 28 19:23:22 localhost named[4141]: client @0x7f1c7c00f870 127.0.0.1#35743/key rndc-key: signer "rndc-key" approved
Apr 28 19:23:22 localhost named[4141]: client @0x7f1c7c00f870 127.0.0.1#35743/key rndc-key: updating zone 'contoh.com/IN
': adding an RR at 'debian.contoh.com' A 192.168.1.100
Apr 28 19:23:22 localhost named[4141]: client @0x7f1c7c00f870 127.0.0.1#35743/key rndc-key: updating zone 'contoh.com/IN
': adding an RR at 'debian.contoh.com' TXT "002d1cc0fe0a2abc1c4e16c7014d414064"
Apr 28 19:23:22 localhost dhcpd[4534]: Added new forward map from debian.contoh.com to 192.168.1.100
```

- Selanjutnya bisa di test dengan menggunakan nslookup

```
root@debian:/var/cache/bind# nslookup debian.contoh.com
Server:         127.0.0.1
Address:        127.0.0.1#53

Non-authoritative answer:
Name:   debian.contoh.com
Address: 192.168.1.100
```

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NTP

Instalasi, jalankan dan verifikasi NTP Server

apt install ntp

```
root@vlab-os332:/home/student# apt install ntp
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libevent-core-2.1-6 libevent-pthreads-2.1-6 libopts25 sntp
Suggested packages:
  ntp-doc
The following NEW packages will be installed:
  libevent-core-2.1-6 libevent-pthreads-2.1-6 libopts25 ntp sntp
0 upgraded, 5 newly installed, 0 to remove and 45 not upgraded.
Need to get 1174 kB of archives.
After this operation, 2898 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

systemctl restart ntp

netstat -npltu | grep 123

```
root@vlab-os332:/home/student# systemctl restart ntp
root@vlab-os332:/home/student# netstat -npltu|grep 123
udp        0      0 10.252.216.132:123      0.0.0.0:*                           5770/ntpd

udp        0      0 127.0.0.1:123           0.0.0.0:*                           5770/ntpd

udp        0      0 0.0.0.0:123             0.0.0.0:*                           5770/ntpd
```

Instalasi, jalankan dan verifikasi NTP Client

apt install ntpdate

```
root@vlab-os332:/home/student# apt install ntpdate
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  ntpdate
```

vim /etc/default/ntpdate

```
# Not used if NTPDATE_USE_NTP_CONF is yes.
NTPSERVERS="10.252.216.132"
```

ntpdate-debian

atau

ntpdate 10.252.216.132

TERIMA KASIH