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BAB 1
PENDAHULUAN

1.1 Latar Belakang

Jaringan komputer atau yang sering disingkat dengan jarkom adalah suatu ilmu yang digunakan untuk mengimplementasikan dua perangkat atau lebih untuk bisa terhubung dengan baik secara fisik maupun secara logika di peruntukan untuk berkomunikasi dalam pertukaran data atau informasi.Dalam pertukan informasi pastinya ada pihak-pihak yang terlibat didalamnya,ada pihak yang mengirimkan/layanan suatu data (server), dan ada juga pihak yang menerima data/lanannya (client).Dan untuk mengimplemantasi dua perangkat yang saling tehubung pasti membutuhkan suatu hardware dan juga software,Selain itu terdapat berbagai macam struktur (topologi), perangkat,metode pengiriman, aturan dan juga manfaat dari jaringan komputer.

Dalam Jaringan komputer terdapat banyak jenis server yang digunakn untuk memberi layanan dari setiap port di sisi client dengan kelebihan dan kekurangan masing-masing server ,tergantung pada fungsi dan tujuan server tersebut seperti web server yang melayani permintaan khusus port http () dan https () , serta terdapat juga mail server melayani permintaan dari port POP3 (*Post Office Protocol 3rd version*) dan IMAP (*Internet Message Access Protocol*). Dan juga terdapat DNS () untuk penamaan suatu ip address dan tanpa dns maka akan mengetikan ip dari server itu sendiri.

Serta untuk saling menghubungkan antar perangkat dalam jaringan komputer maka di butuhkanya sebuah router pada jaringan supaya bisa menghubungkan (routing) antar server / perangkat lain saling terhubung satu sama lainya,untuk routing memiliki berbagai macam dengan kelebihan dan kekurangan yang akan di sesuikan dengan kebutuhan masing masing.

Berdasarkan latar belakang tersebut maka akan di jelaskan terkait DNS, Web server , Mail server , Serta Routing pada jaringan komputer.

1.2 Rumusan Masalah

A. Bagaiamana perancangan sebuah server ?

B. Bagaimana Menginstal DNS,WEB Server dan Mail Server ?

C. Bagaimana cara konfigurasi IP pada client server ?

D. Bagiamana konfigurasi DNS server ?

E. Bagaimana konfigurasi Web server ?

F. Bagiamana konfigurasi Mail server ?

1.3 Tujuan

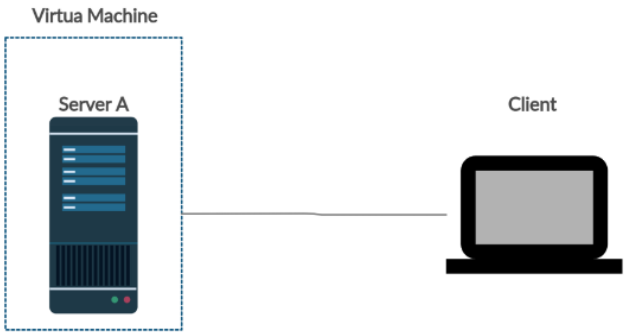
A. Untuk memenuhu tugas akhir Dari SG

BAB 2

PENJELASAN

2.1. Perancangan client server

Dimana client server ini di rancang sesuai dengan gambar berikut :



Dalam gambar diatas yang menjadi sebuah server menggunakan virtual machine dan sebagai client sendiri adalah os/pc yang sedang menjalan kan virtual machine tersebut.

Langkah langkah dalam merancangnya seperti berikut :

- Instalasi terlebih dahulu virtual machine yang akan diguanakan sebagi server kita
- Install linux ubuntu
- Setelah selesai install linux ubuntu maka akan melajutkan kedalam konfigurasi IP server dengan client

2.2. Instalasi DNS, Web server dan mail server

Pertama melakukan instalasi DNS server dengan langkah langkah seperti berikut :

- Mengapdate ubuntu kita terlebih dahulu dengan command sudo apt-get update

```
yahya@yahya-1301184007:~$ sudo apt-get update
Hit:1 http://id.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://security.ubuntu.com/ubuntu focal-security InRelease [109 kB]
Get:3 http://id.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:4 http://id.archive.ubuntu.com/ubuntu focal-backports InRelease [101 kB]
Get:5 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [482
 kB]
```

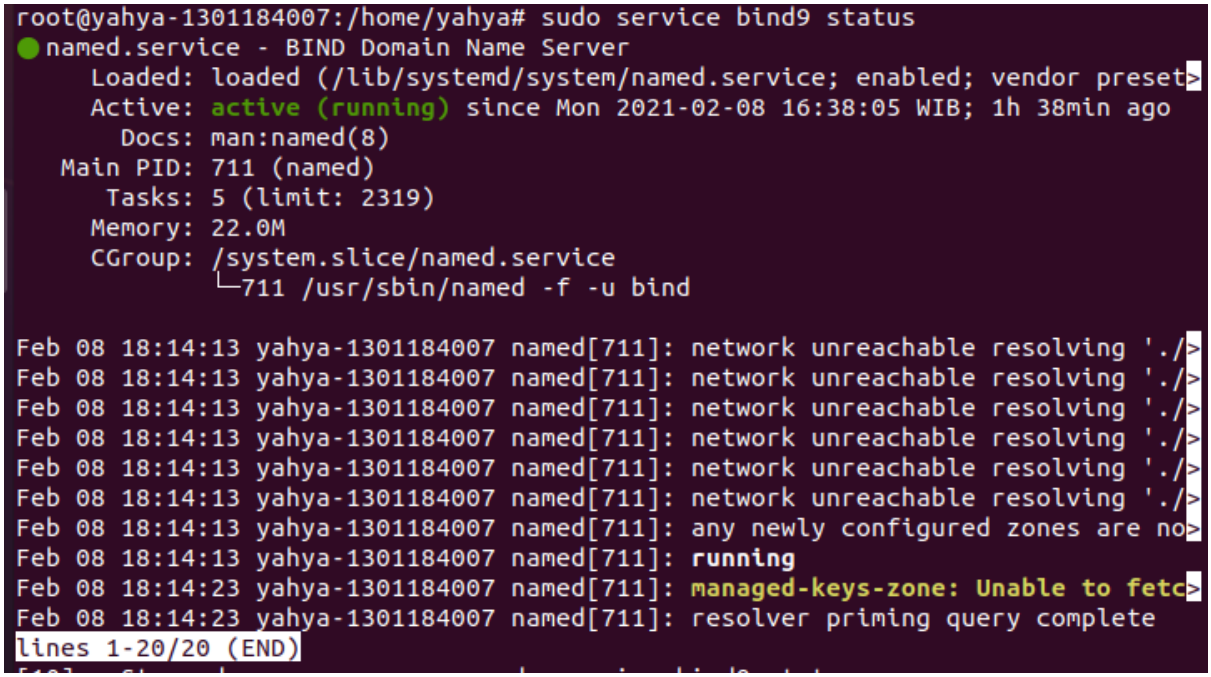
Pastikan jairngan pada virtual box masih nat belum dirubah agar bisa terkoneksi dengan internet yang sedang terhubung didalam pc

- Install bind9 yang dimana software yang biasa digunakan untuk membuat,membangun dan mengatur sebuah DNS dengan command

```
root@yahya-1301184007:/home/yahya# sudo apt install bind9
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  bind9-host bind9utils dnsutils libbind9-160 libdns1100 libirs160 libisc169
  libisccc160 libisccfg160 liblwres160 net-tools python3-ply
Suggested packages:
  bind9-doc resolvconf rblcheck python-ply-doc
The following NEW packages will be installed:
  bind9 bind9utils net-tools python3-ply
The following packages will be upgraded:
  bind9-host dnsutils libbind9-160 libdns1100 libirs160 libisc169 libisccc160
  libisccfg160 liblwres160
9 upgraded, 4 newly installed, 0 to remove and 216 not upgraded.
Need to get 2.405 kB of archives.
After this operation, 4.366 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://id.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libirs160 a
md64 1:9.11.3+dfsg-1ubuntu1.13 [19,1 kB]
Get:2 http://id.archive.ubuntu.com/ubuntu bionic-updates/main amd64 bind9-host
amd64 1:9.11.3+dfsg-1ubuntu1.13 [53,5 kB]
Get:3 http://id.archive.ubuntu.com/ubuntu bionic-updates/main amd64 dnsutils am
d64 1:9.11.3+dfsg-1ubuntu1.13 [145 kB]
Get:4 http://id.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libbind9-16
0 amd64 1:9.11.3+dfsg-1ubuntu1.13 [27,6 kB]
Get:5 http://id.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libisccfg16
0 amd64 1:9.11.3+dfsg-1ubuntu1.13 [48,4 kB]
```

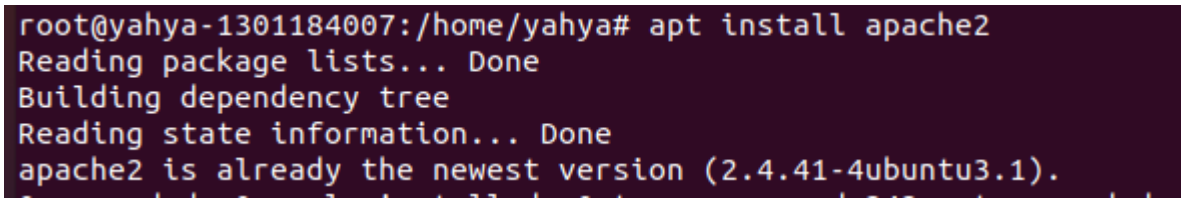
```
Setting up python3-ply (3.11-1) ...
Setting up net-tools (1.60+git20161116.90da8a0-1ubuntu1) ...
Setting up libdns1100:amd64 (1:9.11.3+dfsg-1ubuntu1.13) ...
Setting up liblwres160:amd64 (1:9.11.3+dfsg-1ubuntu1.13) ...
Setting up libisccfg160:amd64 (1:9.11.3+dfsg-1ubuntu1.13) ...
Setting up libirs160:amd64 (1:9.11.3+dfsg-1ubuntu1.13) ...
Setting up libbind9-160:amd64 (1:9.11.3+dfsg-1ubuntu1.13) ...
Setting up bind9utils (1:9.11.3+dfsg-1ubuntu1.13) ...
Setting up bind9-host (1:9.11.3+dfsg-1ubuntu1.13) ...
Setting up bind9 (1:9.11.3+dfsg-1ubuntu1.13) ...
Adding group `bind' (GID 129) ...
Done.
Adding system user `bind' (UID 124) ...
Adding new user `bind' (UID 124) with group `bind' ...
Not creating home directory `/var/cache/bind'.
wrote key file "/etc/bind/rndc.key"
Created symlink /etc/systemd/system/multi-user.target.wants/bind9.service → /li
b/systemd/system/bind9.service.
bind9-pkcs11.service is a disabled or a static unit, not starting it.
bind9-resolvconf.service is a disabled or a static unit, not starting it.
Setting up dnsutils (1:9.11.3+dfsg-1ubuntu1.13) ...
Processing triggers for systemd (237-3ubuntu10.42) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ufw (0.36-0ubuntu0.18.04.1) ...
Processing triggers for ureadahead (0.100.0-21) ...
Processing triggers for libc-bin (2.27-3ubuntu1.2) ...

Progress: [ 98%] [#################################################.]
```



Setelah selesai menginstal DNS maka lanjut menginstal web server yang menggunakan apache dengan langkah seperti berikut :

- Menginstal apache dimana diguanakan untuk membuat koneksi antar server dan browser dengan command apt install apache 2



Dan yang terakhir menginstall mail server menggunakan postfix pada ubuntu dengan langkah langkah berikut :

- Postfix adalah mail tranfer agen default pada system oprasi yang berbasis pada unix mengintal menggunak command

```
root@yahya-1301184007:/home/yahya# apt-get install postfix
Reading package lists... Done
Building dependency tree
Reading state information... Done
postfix is already the newest version (3.4.13-0ubuntu1).
0 upgraded, 0 newly installed, 0 to remove and 343 not upgraded.
root@yahya-1301184007:/home/yahya# sudo apt-get autoremove --purge postfix
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages will be REMOVED:
  postfix*
0 upgraded, 0 newly installed, 1 to remove and 343 not upgraded.
After this operation, 4.540 kB disk space will be freed.
Do you want to continue? [Y/n] Y
(Reading database ... 180841 files and directories currently installed.)
Removing postfix (3.4.13-0ubuntu1) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9) ...
(Reading database ... 180670 files and directories currently installed.)
Purging configuration files for postfix (3.4.13-0ubuntu1) ...
Processing triggers for ufw (0.36-6) ...
Rules updated for profile 'Apache'
Rules updated for profile 'Apache Full'
Firewall reloaded
```

2.3 Konfigurasi ip pada client dan server

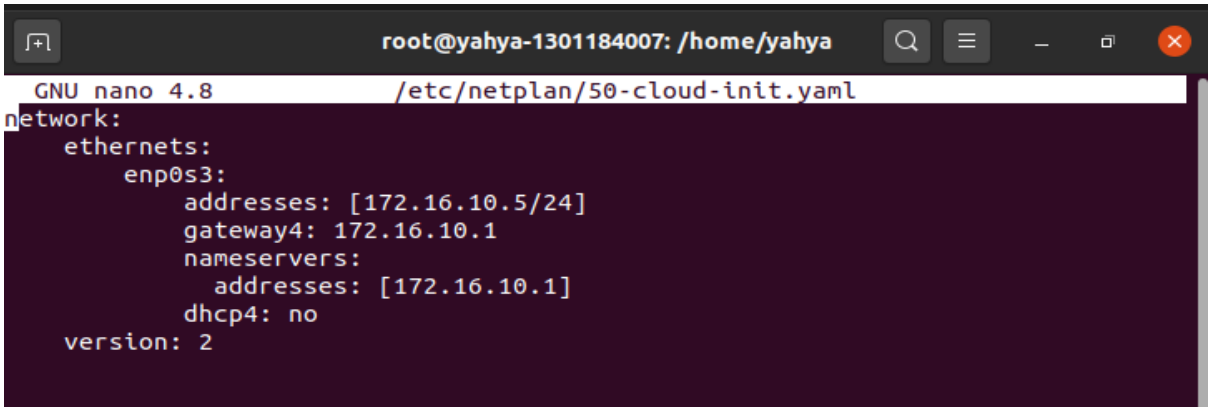
Dimana ip yang sudah ditentukan seperti berikut :

Ip server : 172.16.10.5

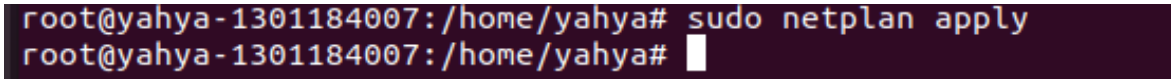
Ip client : IP Server + 1

Ip gateway : 172.16.10.1

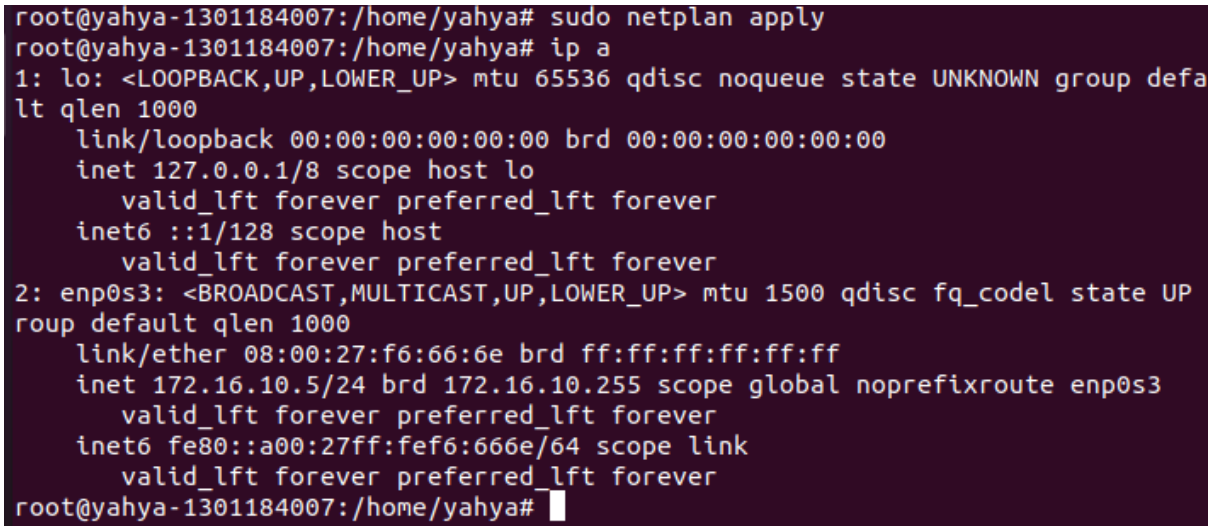
- Maka melakukan setting ip pada server dengen cara berikut :
- Dengan command sudo /etc/netplan/50-cloud-init.yaml



- Setelah command sebelunya maka akan memasukan settingan seperti gambar diatas dengan menseting ip addres gateway dan dibuat static berseta prefik dari ip nya
- Setelah mengisi makan harus menyetujui dari perubahan ip dalam ubuntu dengan cara



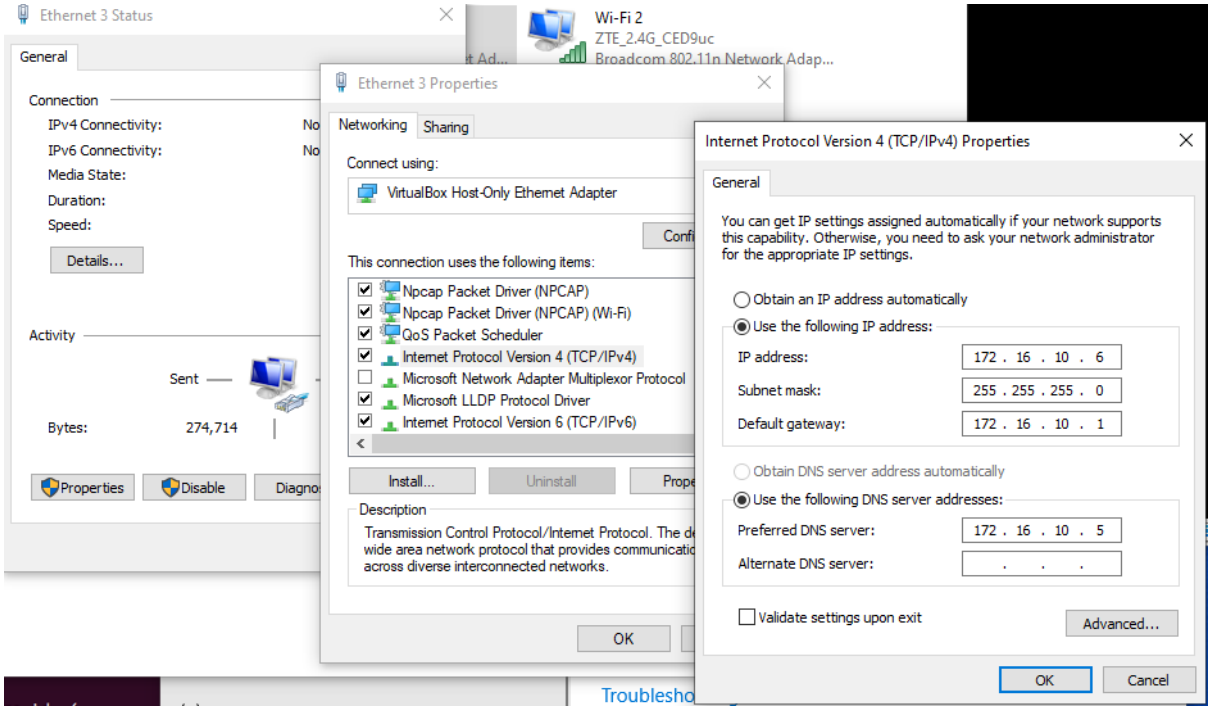
- Maka jika sudah selesai lakukan pengencekan ip didalam ubuntu sudah terganti apa belum dengan command ip a



- Maka sudah terlihat bawah ip pada server sudah terganti sesuai dengan ketentuan

Setelah mengkonfigurasi ip dari server maka akan melakukan konfigurasi ip pada client dengan langkah langkah seperti berikut :

- Masuk kedalam setting lalu masuk ke ethernet pilih ethernet dari virtual box lalu config seperti berikit :



- Setelah itu didalam virtual mechine mengganti network dari NAT kedalam virtual host only.

2.4 Konfigurasi DNS

Konfigurasi dns digunakan untuk menamakan sebuah domain pada server agar client lebih mudah dalam mengakses server.

- Pertama maka kita harus mensetting pada resolv nya dengan command sudo nano /etc/resolv.conf

```
root@yahya-1301184007:/home/yahya# ufw allow 53
Rule added
Rule added (v6)
root@yahya-1301184007:/home/yahya# sudo nano /etc/resolv.conf
root@yahya-1301184007:/home/yahya#
```

```
  GNU nano 4.8                    /etc/resolv.conf
# This file is managed by man:systemd-resolved(8). Do not edit.
#
# This is a dynamic resolv.conf file for connecting local clients to the
# internal DNS stub resolver of systemd-resolved. This file lists all
# configured search domains.
#
# Run "resolvectl status" to see details about the uplink DNS servers
# currently in use.
#
# Third party programs must not access this file directly, but only through the
# symlink at /etc/resolv.conf. To manage man:resolv.conf(5) in a different way,
# replace this symlink by a static file or a different symlink.
#
# See man:systemd-resolved.service(8) for details about the supported modes of
# operation for /etc/resolv.conf.

nameserver 172.16.10.5
search netos.co.id
```

Terminal

- Lalu masuk kedalam direktori etc/bind/ dan mengedit file default-zones seperti gambar di bawah ini.

```
root@yahya-1301184007:/etc/bind# nano named.conf.default-zones
root@yahya-1301184007:/etc/bind#
```

```
// prime the server with knowledge of the root servers
zone "." {
        type hint;
        file "/usr/share/dns/root.hints";
};

// be authoritative for the localhost forward and reverse zones, and for
// broadcast zones as per RFC 1912

zone "netos.co.id" {
        type master;
        file "/etc/bind/db.netos";
};

zone "10.16.172.in-addr.arpa" {
        type master;
        file "/etc/bind/db.web";
};

zone "0.in-addr.arpa" {
        type master;
        file "/etc/bind/db.0";
};

zone "255.in-addr.arpa" {
```

Files

- Dimana zone di ganti dnegan nama domain netos.co.id dan memasukan network dari ip kita dengan cara di balik setelah itu save

- Setelah melakukan itu maka lanjut dengan mengcopy db.local pada db.netos (bisa terserah Namanya) dan juga mengcopy db127 dengan db.web

```
root@yahya-1301184007:/etc/bind# cp db.local db.netos
root@yahya-1301184007:/etc/bind# cp db.127 db.web
```

- Lalu masuk kedalam db.netos dan mensetting

```
  GNU nano 4.8                          db.netos
;
; BIND data file for local loopback interface
;
$TTL    604800
@       IN      SOA     netos.co.id. root.netos.co.id. (
                              2         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      netos.co.id.
@       IN      A       172.16.10.5
ns      IN      A       172.16.10.5
data    IN      A       172.16.10.5
mail    IN      A       172.16.10.5
```

- Dimana nama domain dimasukan dan ip dari domain juga dimasukan dalam db.netos
- Setelah itu mensetting db.web dengan seperti berikut

```
  GNU nano 4.8                          db.web
;
; BIND reverse data file for local loopback interface
;
$TTL    604800
@       IN      SOA     netos.co.id. root.netos.co.id. (
                              1         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      netos.co.id.
5       IN      PTR     ns.netos.co.id.
5       IN      PTR     data.netos.co.id.
5       IN      PTR     mail.netos.co.id.
```

- Dimana 5 adalah ip host dari ip server atau domain karena mengguna ip kelas c maka hanya 5 yang dimasukan.
- Setelah selesai maka restart bind9 pada server.

```
root@yahya-1301184007:/etc/bind# sudo systemctl restart bind9
```

- Jika sudah cek dengan command nslookup ip server

```
root@yahya-1301184007:/etc/bind# nslookup 172.16.10.5
5.10.16.172.in-addr.arpa        name = ns.netos.co.id.
5.10.16.172.in-addr.arpa        name = mail.netos.co.id.
5.10.16.172.in-addr.arpa        name = data.netos.co.id.
```

2.5 Konfigurasi Web Server

Diman pada konfigurai mail server ini yang akan di setting adalah apache langkah langkah yang dilakukan untuk mensetting seperti berikut :

- Masuk kedalam direktori apache dengan comman cd /etc/apache/

```
root@yahya-1301184007:/etc/bind# cd /etc/apache2/
root@yahya-1301184007:/etc/apache2# ls
apache2.conf    conf-enabled  magic          mods-enabled  sites-available
conf-available  envvars       mods-available  ports.conf    sites-enabled
root@yahya-1301184007:/etc/apache2# cd sites-enabled/
You have new mail in /var/mail/root
root@yahya-1301184007:/etc/apache2/sites-enabled# ls
000-default.conf
root@yahya-1301184007:/etc/apache2/sites-enabled# cp 000-default.conf netos.con
f
root@yahya-1301184007:/etc/apache2/sites-enabled# ls
000-default.conf  netos.conf
root@yahya-1301184007:/etc/apache2/sites-enabled# cp 000-default.conf data.conf
root@yahya-1301184007:/etc/apache2/sites-enabled# cp 000-default.conf mail.conf
root@yahya-1301184007:/etc/apache2/sites-enabled# ls
000-default.conf  data.conf  mail.conf  netos.conf
root@yahya-1301184007:/etc/apache2/sites-enabled#
```

- Setelah itu masuk kedalam direktori sites-enable dan mengcopy 000-default.conf
- Lalu masuk kedalam file yang sudah di copy dengan nama yang sudah di isikan

```
root@yahya-1301184007:/etc/apache2/sites-enabled# nano netos.conf
```

- Dengan mensetting isi didalmnya seperti berikut
- Untuk domain netos.co.id dengan port 80

```
<VirtualHost 172.16.10.5:80>
        # The ServerName directive sets the request scheme, hostname and port >
        # the server uses to identify itself. This is used when creating
        # redirection URLs. In the context of virtual hosts, the ServerName
        # specifies what hostname must appear in the request's Host: header to
        # match this virtual host. For the default virtual host (this file) th>
        # value is not decisive as it is used as a last resort host regardless.
        # However, you must set it for any further virtual host explicitly.
        #ServerName www.example.com

        ServerAdmin webmaster@netos.co.id
        DocumentRoot /home/yahya/netos/html
        <Directory /home/yahya/netos/html>
        Require all granted
        </Directory>

        # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
        # error, crit, alert, emerg.
        # It is also possible to configure the loglevel for particular
        # modules, e.g.
        #LogLevel info ssl:warn

        ErrorLog ${APACHE_LOG_DIR}/error.log
        CustomLog ${APACHE_LOG_DIR}/access.log combined
```

- Untuk domain data.netos.co.id dengan port 8080

```
<VirtualHost 172.16.10.5:8080>
        # The ServerName directive sets the request scheme, hostname and port >
        # the server uses to identify itself. This is used when creating
        # redirection URLs. In the context of virtual hosts, the ServerName
        # specifies what hostname must appear in the request's Host: header to
        # match this virtual host. For the default virtual host (this file) th>
        # value is not decisive as it is used as a last resort host regardless.
        # However, you must set it for any further virtual host explicitly.
        #ServerName www.example.com

        ServerAdmin webmaster@data.netos.co.id
        DocumentRoot /home/yahya/data/html
        <Directory /home/yahya/data/html>
        Require all granted
        </Directory>

        # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
        # error, crit, alert, emerg.
        # It is also possible to configure the loglevel for particular
        # modules, e.g.
        #LogLevel info ssl:warn

        ErrorLog ${APACHE_LOG_DIR}/error.log
        CustomLog ${APACHE_LOG_DIR}/access.log combined
```

- Setelah itu maka masuk kedalam directory yang sudah kita masukan sebelumnya dan membuat index.html didalam directory tadi seperti berikut

```
root@yahya-1301184007:/etc/apache2/sites-enabled# cd /home/yahya/
root@yahya-1301184007:/home/yahya# ls
Desktop    Downloads  nano.save  Public     Videos
Documents  Music      Pictures   Templates  y
root@yahya-1301184007:/home/yahya# mkdir netos
root@yahya-1301184007:/home/yahya# ls
Desktop    Downloads  nano.save  Pictures   Templates  y
Documents  Music      netos      Public     Videos
root@yahya-1301184007:/home/yahya# cd netos/
```

```
root@yahya-1301184007:/home/yahya/netos# mkdir html
```

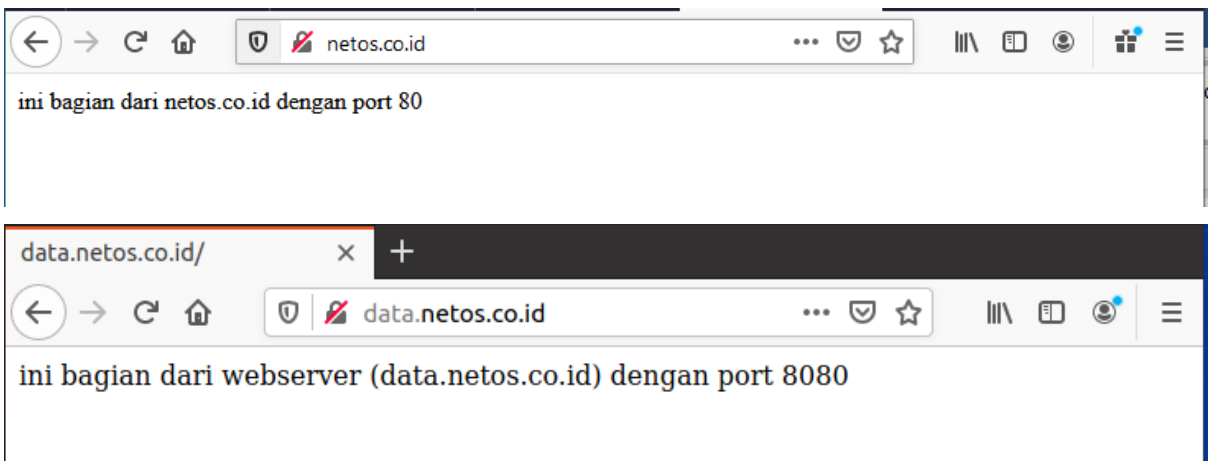
```
root@yahya-1301184007:/etc/apache2/sites-enabled# cd /home/yahya/
root@yahya-1301184007:/home/yahya# ls
Desktop    Downloads  nano.save  Public     Videos
Documents  Music      Pictures   Templates  y
root@yahya-1301184007:/home/yahya# mkdir netos
root@yahya-1301184007:/home/yahya# ls
Desktop    Downloads  nano.save  Pictures   Templates  y
Documents  Music      netos      Public     Videos
root@yahya-1301184007:/home/yahya# cd netos/
root@yahya-1301184007:/home/yahya/netos# ls
root@yahya-1301184007:/home/yahya/netos# nano index.html
root@yahya-1301184007:/home/yahya/netos# ls
i Show Applications
root@yahya-1301184007:/home/yahya/netos#
```

- Setelah membuat file indek html di isi sesuai dengan keinginan maka ijinkan akses dari directory tersebut dengan cara seperti berikut dan merestart apache nya

```
root@yahya-1301184007:/home/yahya# chmod 777 -R netos
```

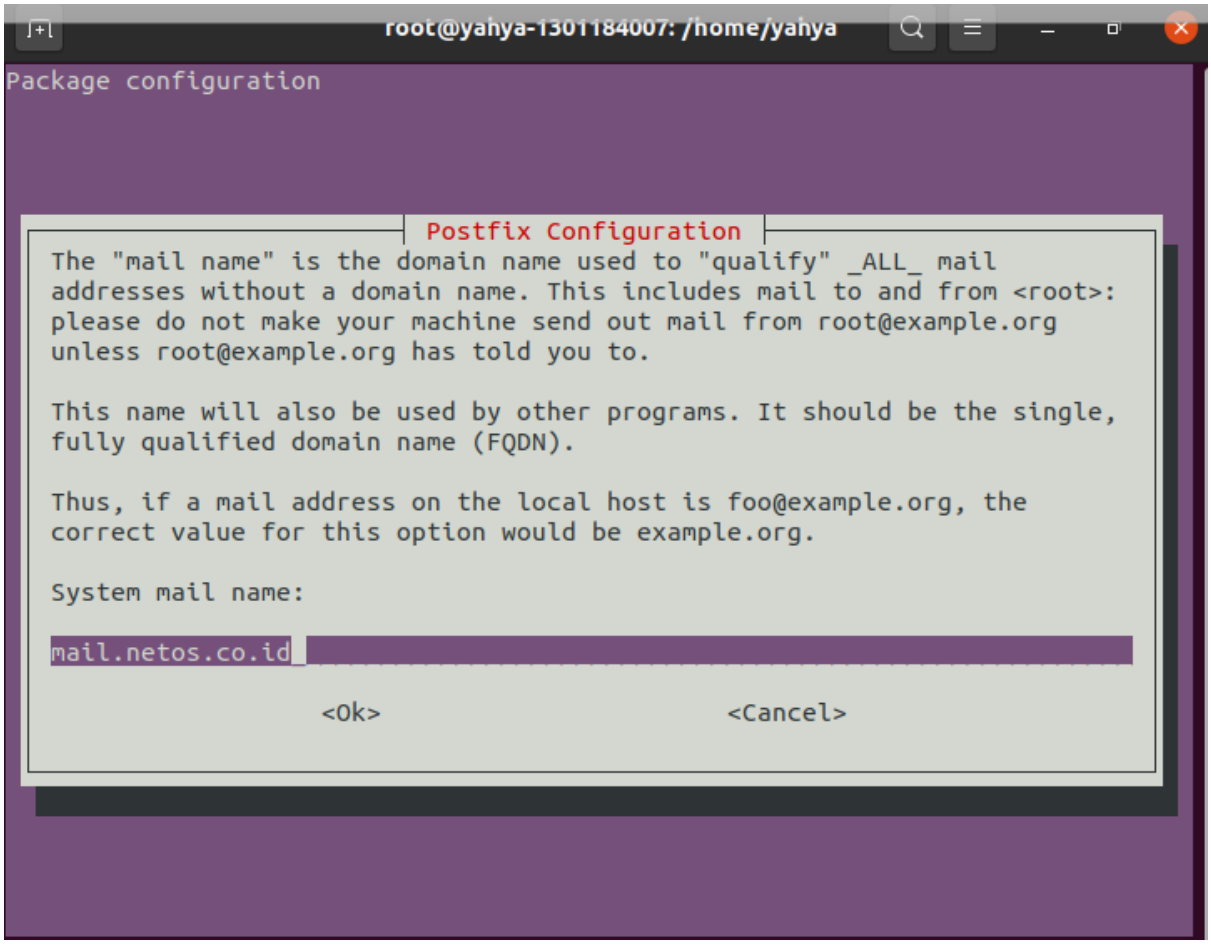
```
root@yahya-1301184007:/home/yahya# cd netos/
root@yahya-1301184007:/home/yahya/netos# chmod 777 -R html
root@yahya-1301184007:/home/yahya/netos# /etc/init.d/apache2 restart
Restarting apache2 (via systemctl): apache2.service.
```

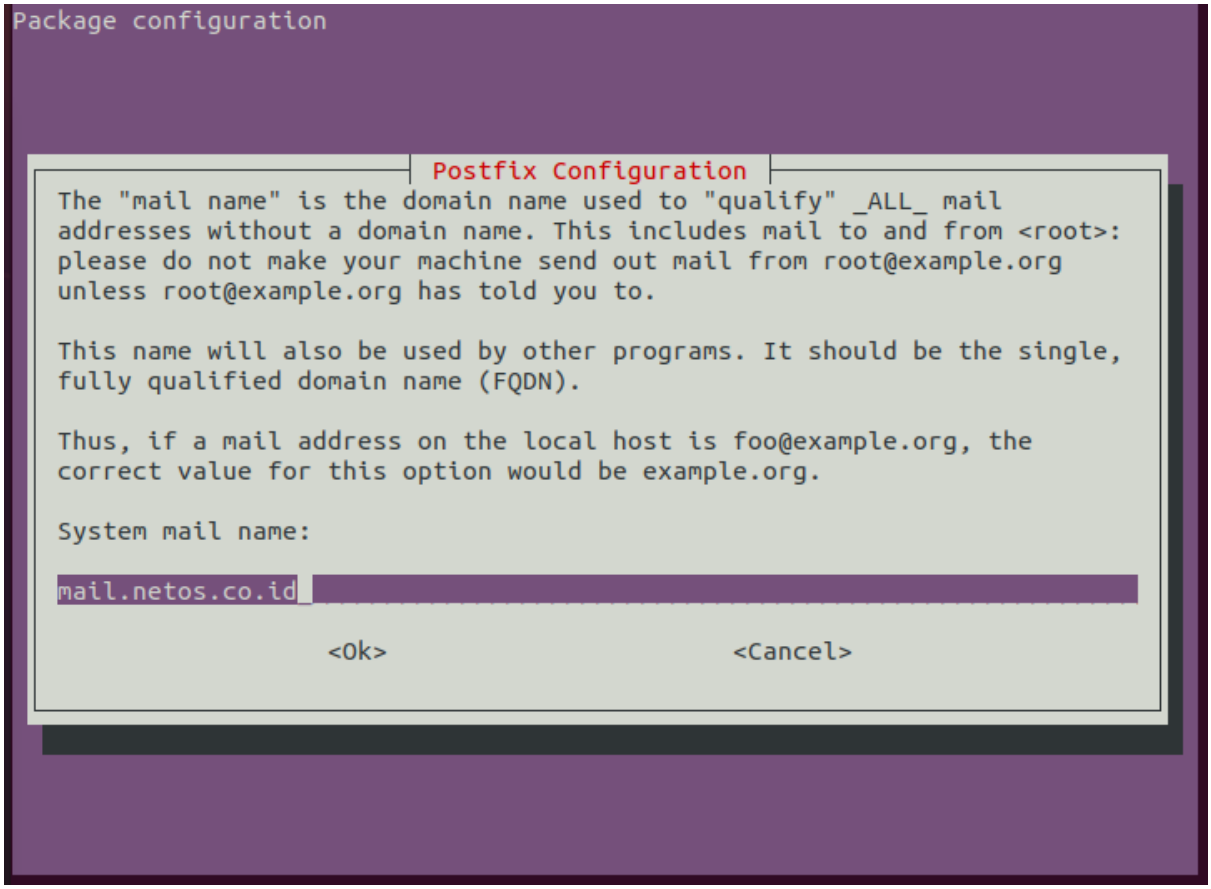
- Setelah itu cek dengan mengetikan nama domain pada browser pada client

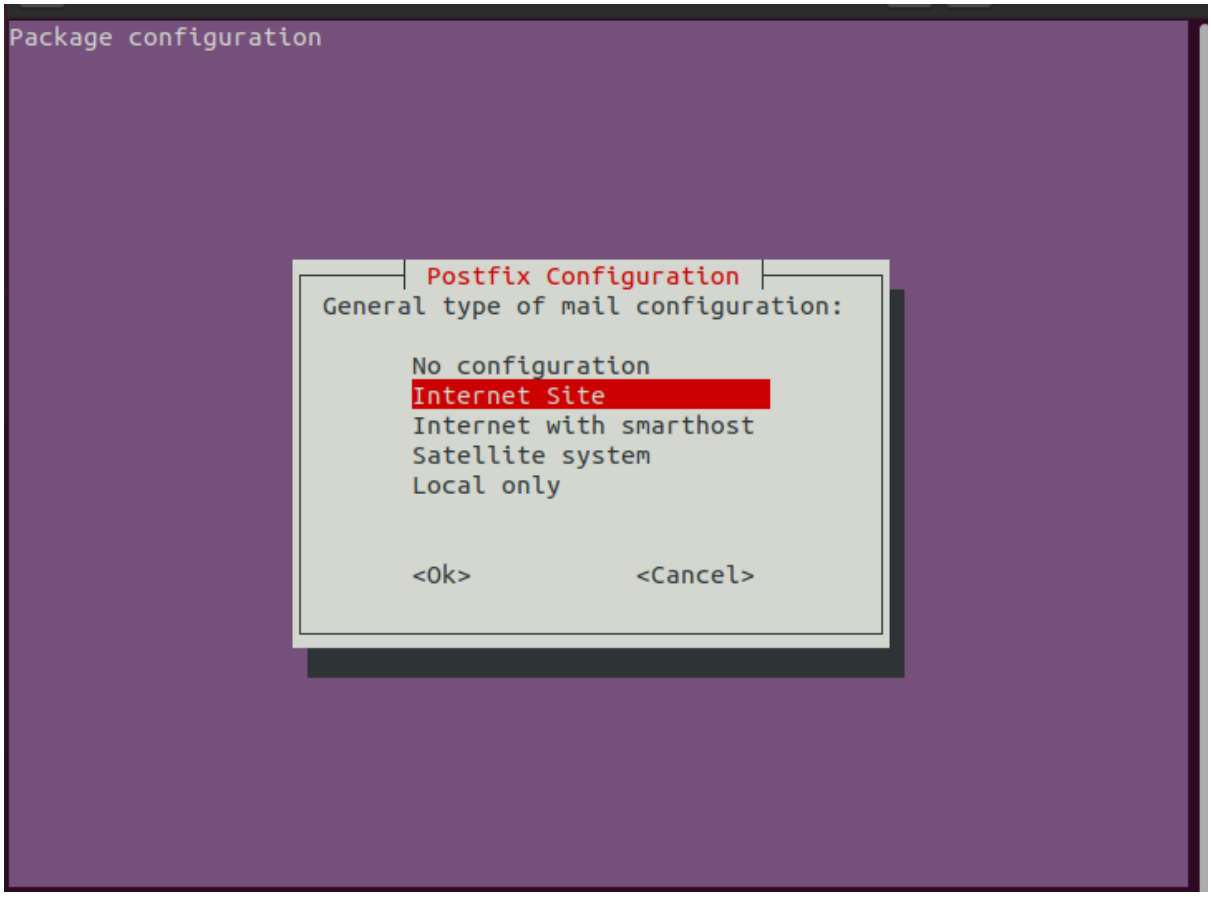


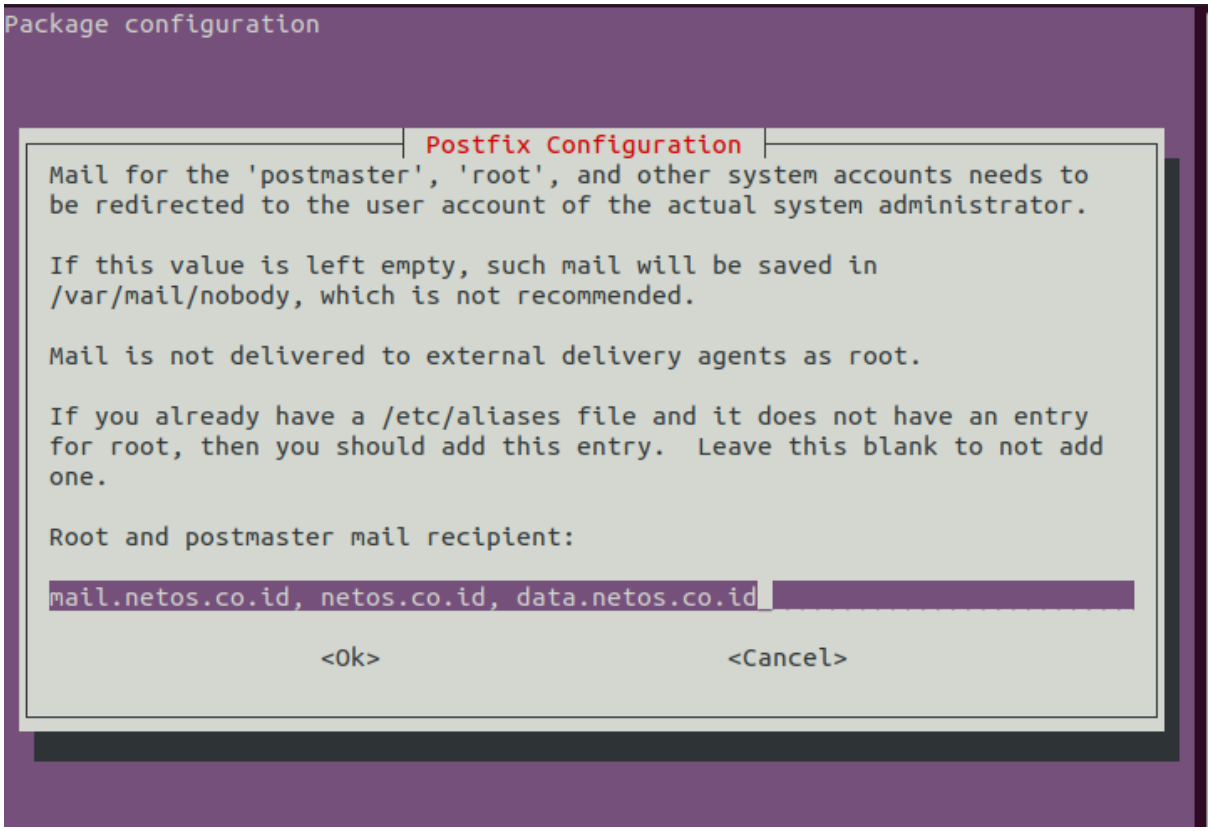
2.6 konfigurasi pada Mail server

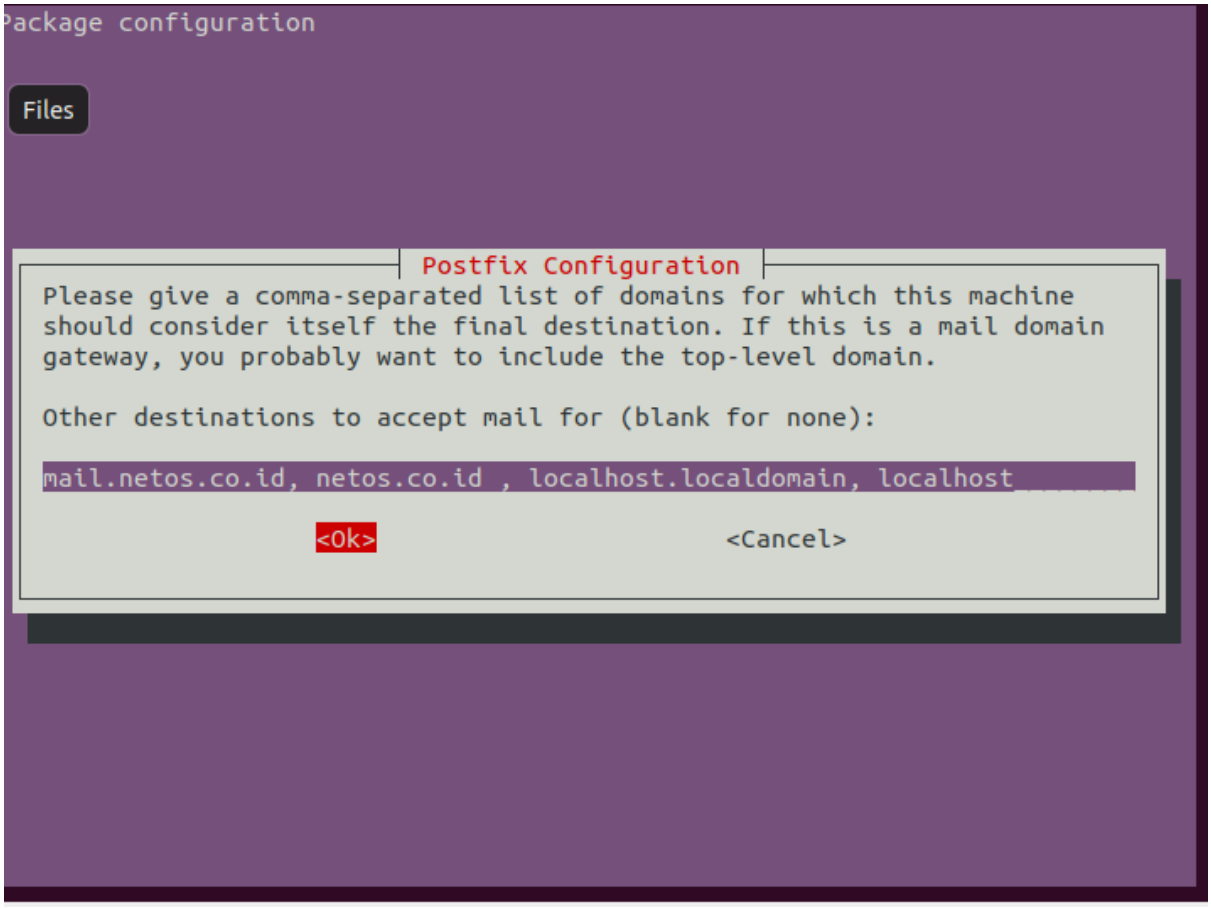
- Pertama melakukan instalasi pada mail
- Setelah itu melakuakan step step seperti dibawah ini

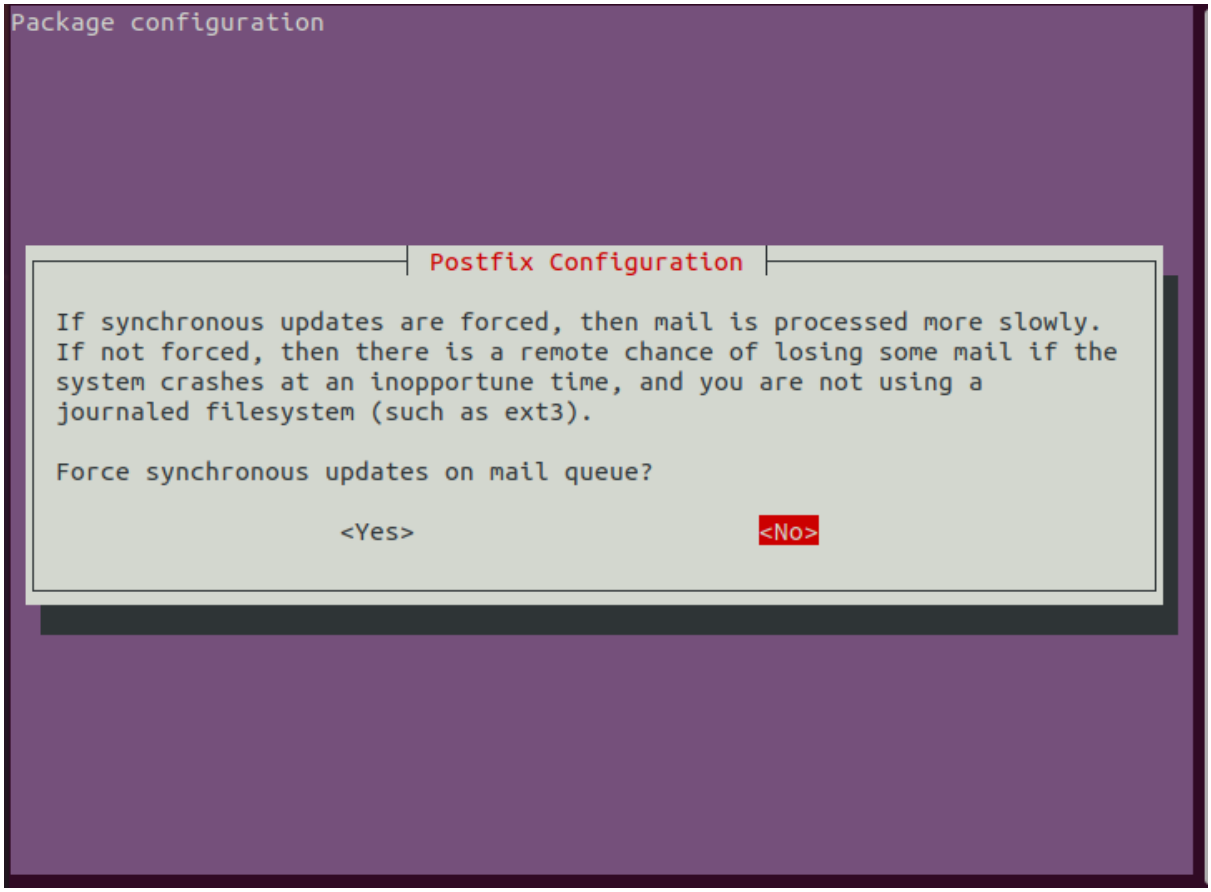


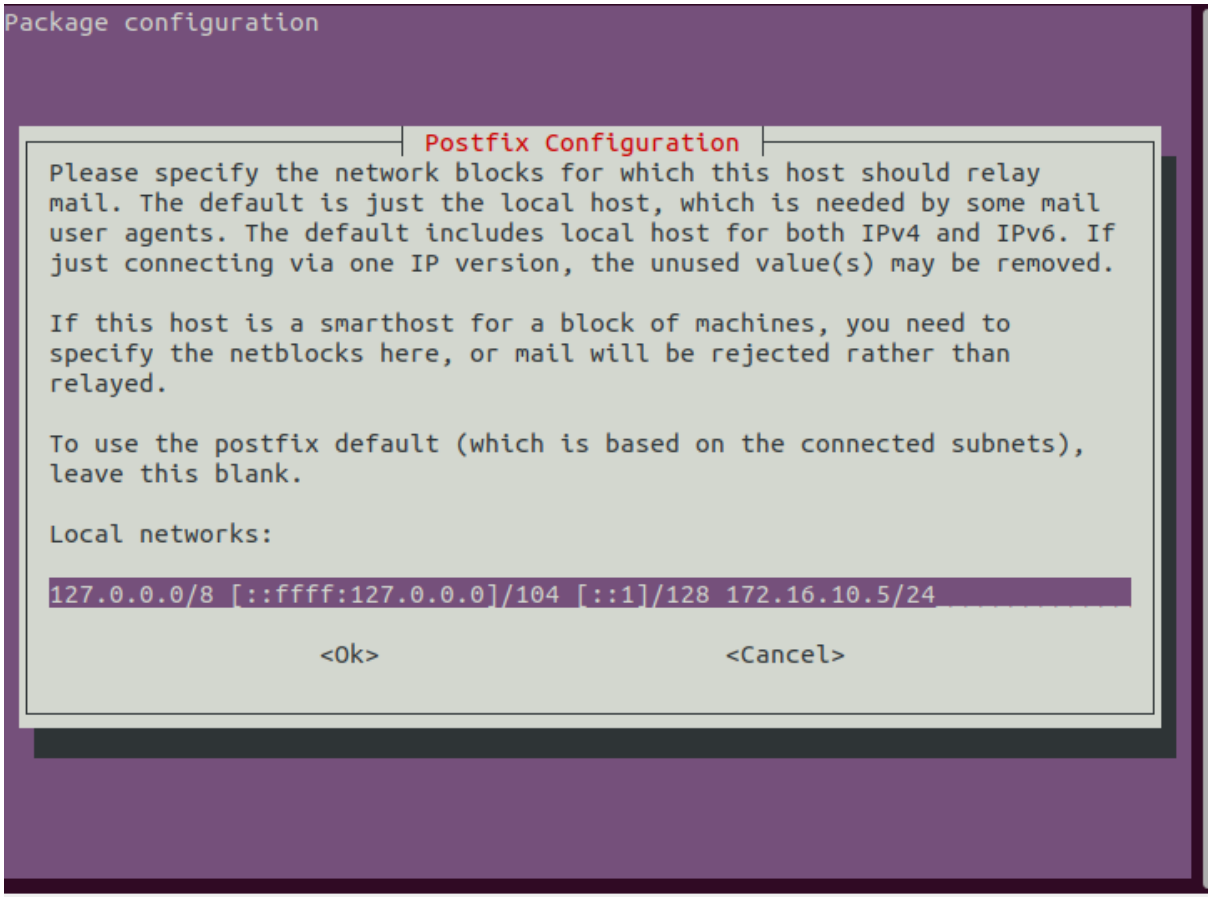

Package configuration
Postfix Configuration
The "mail name" is the domain name used to "qualify" _ALL_ mail
addresses without a domain name. This includes mail to and from <root>:
please do not make your machine send out mail from root@example.org
unless root@example.org has told you to.
This name will also be used by other programs. It should be the single,
fully qualified domain name (FQDN).
Thus, if a mail address on the local host is foo@example.org, the
correct value for this option would be example.org.
System mail name:
mail.netos.co.id
<Ok>
<Cancel>

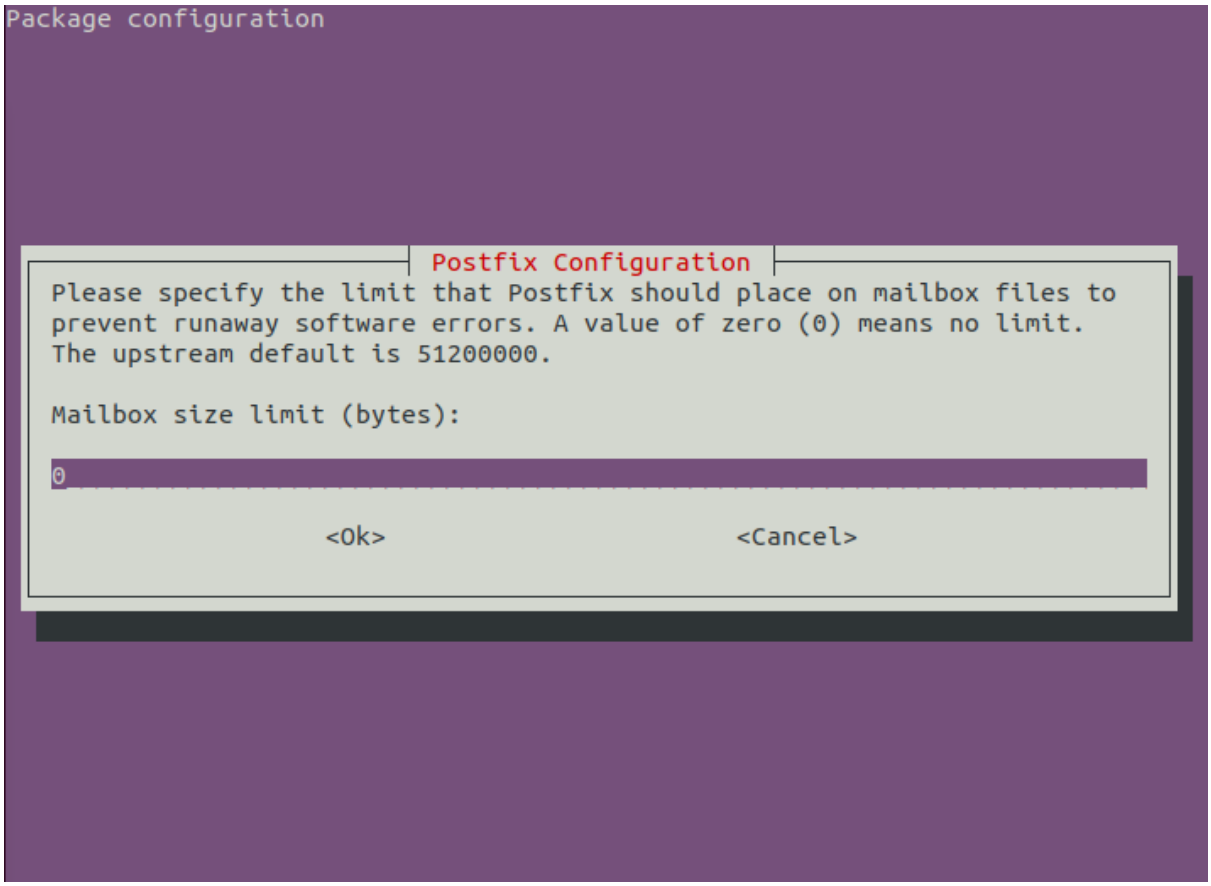

Package configuration
Postfix Configuration
General type of mail configuration:
No configuration
Internet Site
Internet with smarthost
Satellite system
Local only
<Ok>
<Cancel>

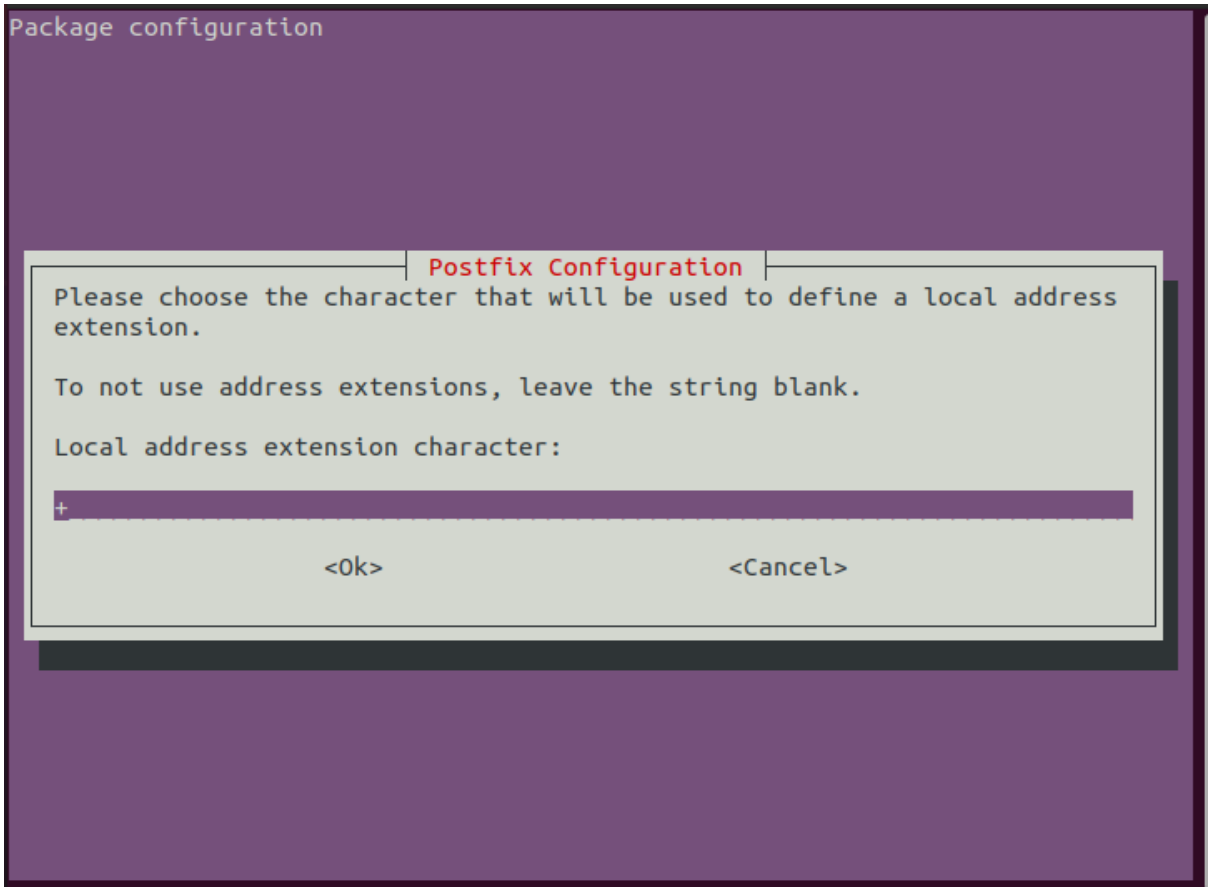

Package configuration
Postfix Configuration
Mail for the 'postmaster', 'root', and other system accounts needs to be redirected to the user account of the actual system administrator.
If this value is left empty, such mail will be saved in /var/mail/nobody, which is not recommended.
Mail is not delivered to external delivery agents as root.
If you already have a /etc/aliases file and it does not have an entry for root, then you should add this entry. Leave this blank to not add one.
Root and postmaster mail recipient:
mail.netos.co.id, netos.co.id, data.netos.co.id
<Ok>
<Cancel>

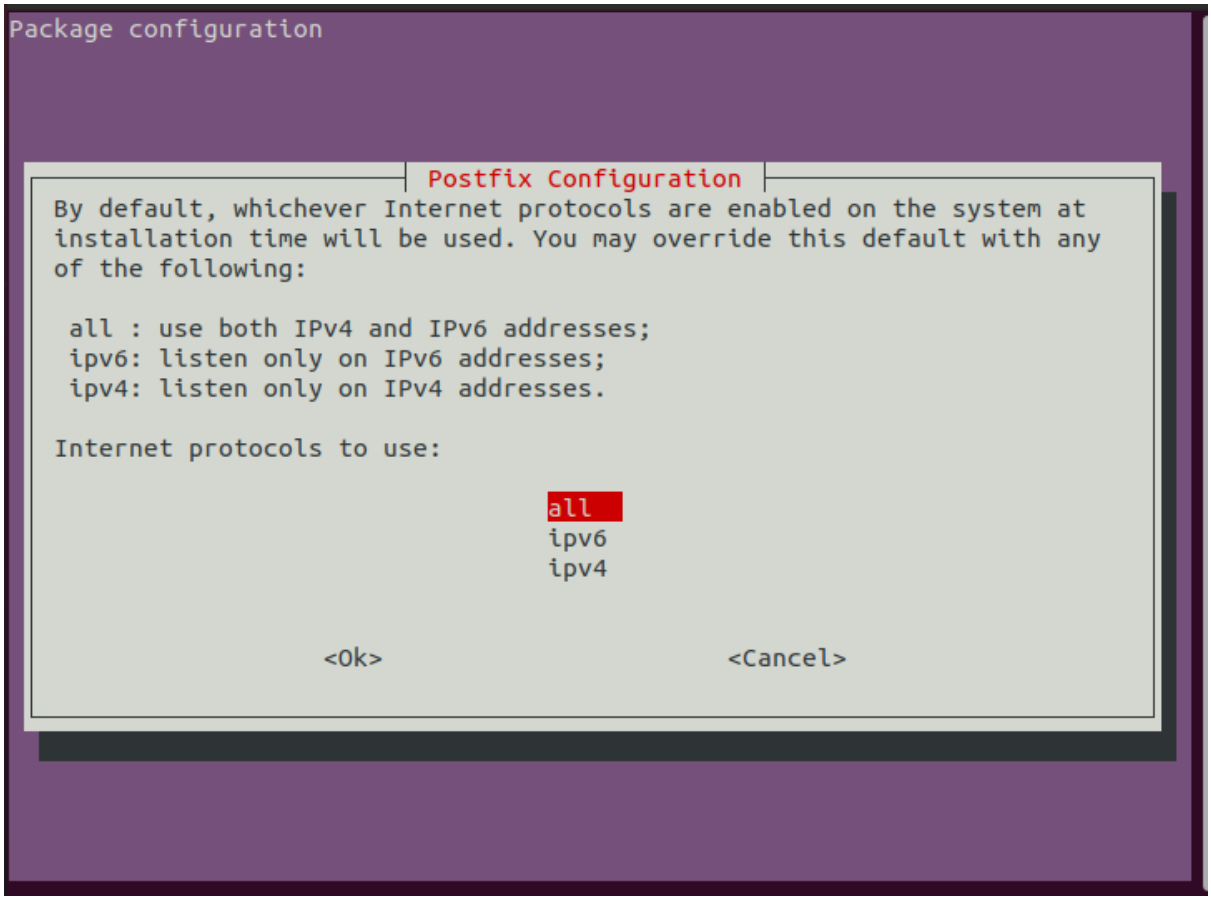

Package configuration
Files
Postfix Configuration
Please give a comma-separated list of domains for which this machine
should consider itself the final destination. If this is a mail domain
gateway, you probably want to include the top-level domain.
Other destinations to accept mail for (blank for none):
mail.netos.co.id, netos.co.id , localhost.localdomain, localhost
<Ok>
<Cancel>


Package configuration
Postfix Configuration
If synchronous updates are forced, then mail is processed more slowly.
If not forced, then there is a remote chance of losing some mail if the
system crashes at an inopportune time, and you are not using a
journaled filesystem (such as ext3).
Force synchronous updates on mail queue?
<Yes>
<No>


Package configuration
Postfix Configuration
Please specify the network blocks for which this host should relay
mail. The default is just the local host, which is needed by some mail
user agents. The default includes local host for both IPv4 and IPv6. If
just connecting via one IP version, the unused value(s) may be removed.
If this host is a smarthost for a block of machines, you need to
specify the netblocks here, or mail will be rejected rather than
relayed.
To use the postfix default (which is based on the connected subnets),
leave this blank.
Local networks:
127.0.0.0/8 [::ffff:127.0.0.0]/104 [::1]/128 172.16.10.5/24
<Ok>
<Cancel>


Package configuration
Postfix Configuration
Please specify the limit that Postfix should place on mailbox files to prevent runaway software errors. A value of zero (0) means no limit. The upstream default is 51200000.
Mailbox size limit (bytes):
0
<Ok>
<Cancel>


Package configuration
Postfix Configuration
Please choose the character that will be used to define a local address extension.
To not use address extensions, leave the string blank.
Local address extension character:
+
<Ok>
<Cancel>


Package configuration
Postfix Configuration
By default, whichever Internet protocols are enabled on the system at installation time will be used. You may override this default with any of the following:
all : use both IPv4 and IPv6 addresses;
ipv6: listen only on IPv6 addresses;
ipv4: listen only on IPv4 addresses.
Internet protocols to use:
all
ipv6
ipv4
<Ok>
<Cancel>

```
root@yahya-1301184007:/home/yahya# dpkg-reconfigure postfix
setting synchronous mail queue updates: false
setting myorigin
setting destinations: mail.netos.co.id, netos.co.id , localhost.localdomain, lo
calhost
setting relayhost:
setting mynetworks: 127.0.0.0/8 [::ffff:127.0.0.0]/104 [::1]/128 172.16.10.5/24
setting mailbox_size_limit: 0
setting recipient_delimiter: +
setting inet_interfaces: all
setting inet_protocols: all
WARNING: /etc/aliases exists, but does not have a root alias.

Postfix (main.cf) is now set up with the changes above.  If you need to make
changes, edit /etc/postfix/main.cf (and others) as needed.  To view Postfix
configuration values, see postconf(1).

After modifying main.cf, be sure to run 'systemctl reload postfix'.

Running newaliases
Processing triggers for libc-bin (2.31-0ubuntu9) ...
root@yahya-1301184007:/home/yahya#
```

```
root@yahya-1301184007:/home/yahya# nano /etc/postfix/main.cf


Use "fg" to return to nano.

[1]+  Stopped                 nano /etc/postfix/main.cf
root@yahya-1301184007:/home/yahya# service postfix restart
root@yahya-1301184007:/home/yahya# nano /etc/postfix/main.cf
You have new mail in /var/mail/root
root@yahya-1301184007:/home/yahya# service postfix restart
root@yahya-1301184007:/home/yahya# /etc/init.d/courier-pop restart
Restarting courier-pop (via systemctl): courier-pop.service.
root@yahya-1301184007:/home/yahya# /etc/init.d/courier-imap restart
```

```
root@yahya-1301184007:/etc/apache2/sites-enabled# nano mail.conf
```

```
<VirtualHost 172.16.10.5:443>
        # The ServerName directive sets the request scheme, hostname and port >
        # the server uses to identify itself. This is used when creating
        # redirection URLs. In the context of virtual hosts, the ServerName
        # specifies what hostname must appear in the request's Host: header to
        # match this virtual host. For the default virtual host (this file) th>
        # value is not decisive as it is used as a last resort host regardless.
        # However, you must set it for any further virtual host explicitly.
        #ServerName www.example.com

        ServerAdmin webmaster@mail.netos.co.id
        DocumentRoot /home/yahya/mail/html
        <Directory /home/yahya/mail/html>
        Require all granted
        </Directory>

        # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
        # error, crit, alert, emerg.
        # It is also possible to configure the loglevel for particular
        # modules, e.g.
        #LogLevel info ssl:warn

        ErrorLog ${APACHE_LOG_DIR}/error.log
        CustomLog ${APACHE_LOG_DIR}/access.log combined

                                [ Read 34 lines ]
```

```
root@yahya-1301184007:/home/yahya# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group defau
lt qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP g
roup default qlen 1000
    link/ether 08:00:27:f6:66:6e brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.2/24 brd 192.168.1.255 scope global noprefixroute enp0s3
       valid_lft forever preferred_lft forever
    inet6 fe80::a00:27ff:fef6:666e/64 scope link
       valid_lft forever preferred_lft forever
root@yahya-1301184007:/home/yahya# sudo nano /etc/netplan/50-cloud-init.yaml
```

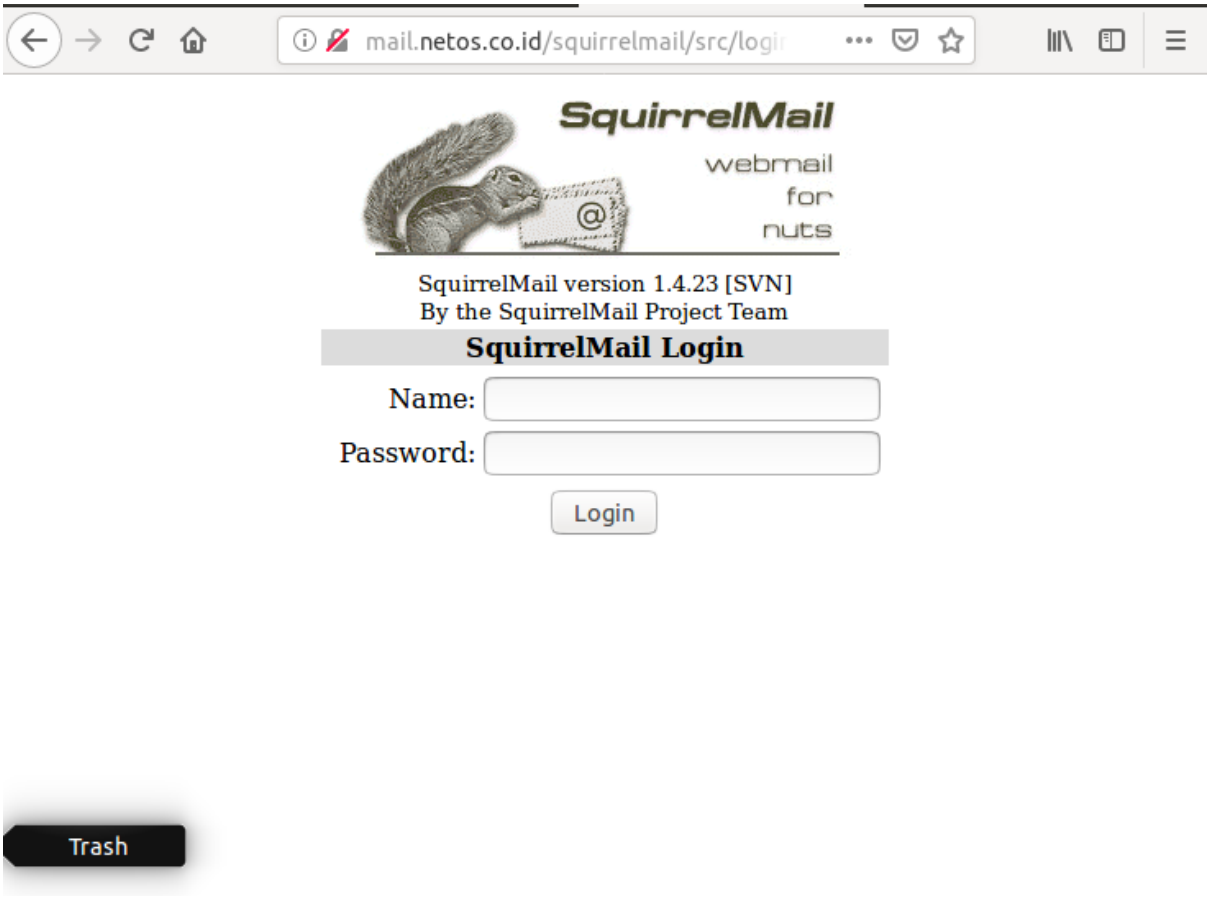
- Setelah itu melakukan penambahan user dengan nama mail1 mail2 mail3

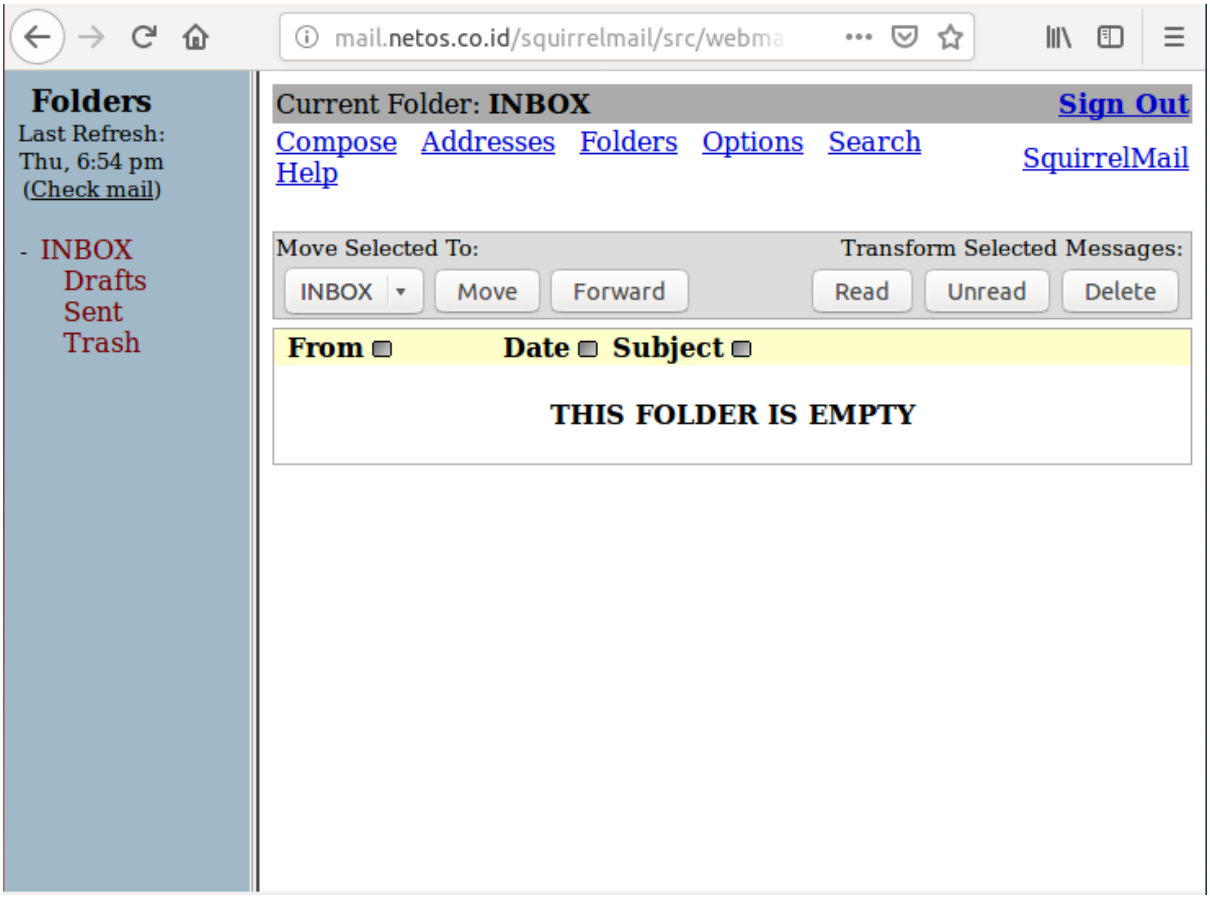
```
root@yahya-1301184007:/home/yahya# maildirmake.courier /etc/skel/Maildir
root@yahya-1301184007:/home/yahya# adduser mail1
Adding user `mail1' ...
Adding new group `mail1' (1004) ...
Adding new user `mail1' (1004) with group `mail1' ...
Creating home directory `/home/mail1' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for mail1
Enter the new value, or press ENTER for the default
        Full Name []: mail1
        Room Number []:
        Work Phone []:
        Home Phone []:
        Other []:
Is the information correct? [Y/n] Y
```

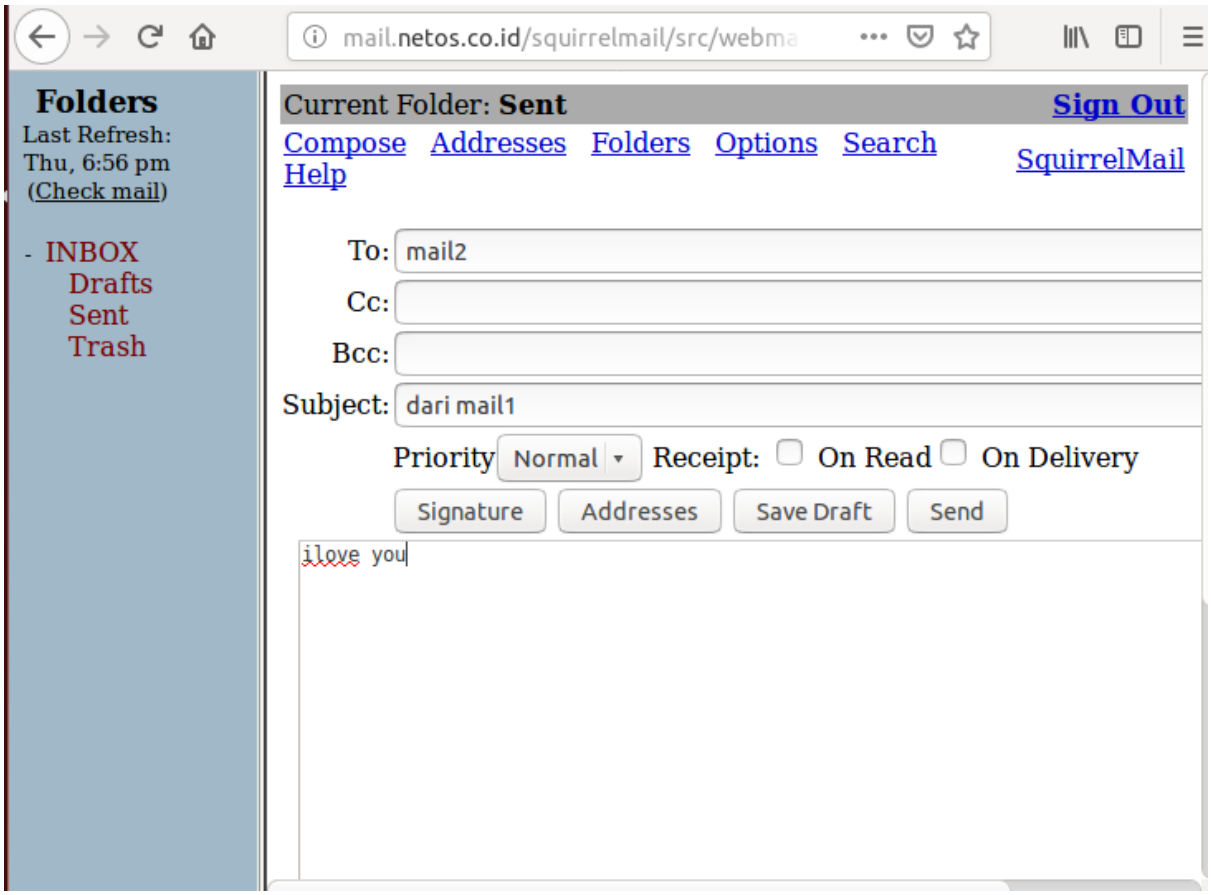
```
root@yahya-1301184007:/home/yahya# adduser mail2
Adding user `mail2' ...
Adding new group `mail2' (1005) ...
Adding new user `mail2' (1005) with group `mail2' ...
Creating home directory `/home/mail2' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for mail2
Enter the new value, or press ENTER for the default
        Full Name []: mail2
        Room Number []:
        Work Phone []:
        Home Phone []:
        Other []:
Is the information correct? [Y/n] Y
```

```
root@yahya-1301184007:/home/yahya# adduser mail3
Adding user `mail3' ...
Adding new group `mail3' (1006) ...
Adding new user `mail3' (1006) with group `mail3' ...
Creating home directory `/home/mail3' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for mail3
Enter the new value, or press ENTER for the default
        Full Name []: mail3
        Room Number []:
        Work Phone []:
        Home Phone []:
        Other []:
Is the information correct? [Y/n] Y
root@yahya-1301184007:/home/yahya#
```

- Selah itu masuk kedalam browser dengan mengetikan domain kita yang sudah disetting tadi dan melaukan pengiriman ketiap user yang sudah dibuat sebelumnya




mail.netos.co.id/squirrelmail/src/webma
Folders
Last Refresh:
Thu, 6:54 pm
(Check mail)
- INBOX
Drafts
Sent
Trash
Current Folder: INBOX
Sign Out
Compose Addresses Folders Options Search
Help
SquirrelMail
Move Selected To:
Transform Selected Messages:
INBOX
Move
Forward
Read
Unread
Delete
From
Date
Subject
THIS FOLDER IS EMPTY


mail.netos.co.id/squirrelmail/src/webma
Folders
Last Refresh:
Thu, 6:56 pm
(Check mail)
- INBOX
Drafts
Sent
Trash
Current Folder: Sent
Sign Out
Compose Addresses Folders Options Search
Help
SquirrelMail
To: mail2
Cc:
Bcc:
Subject: dari mail1
Priority Normal
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Signature
Addresses
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Send
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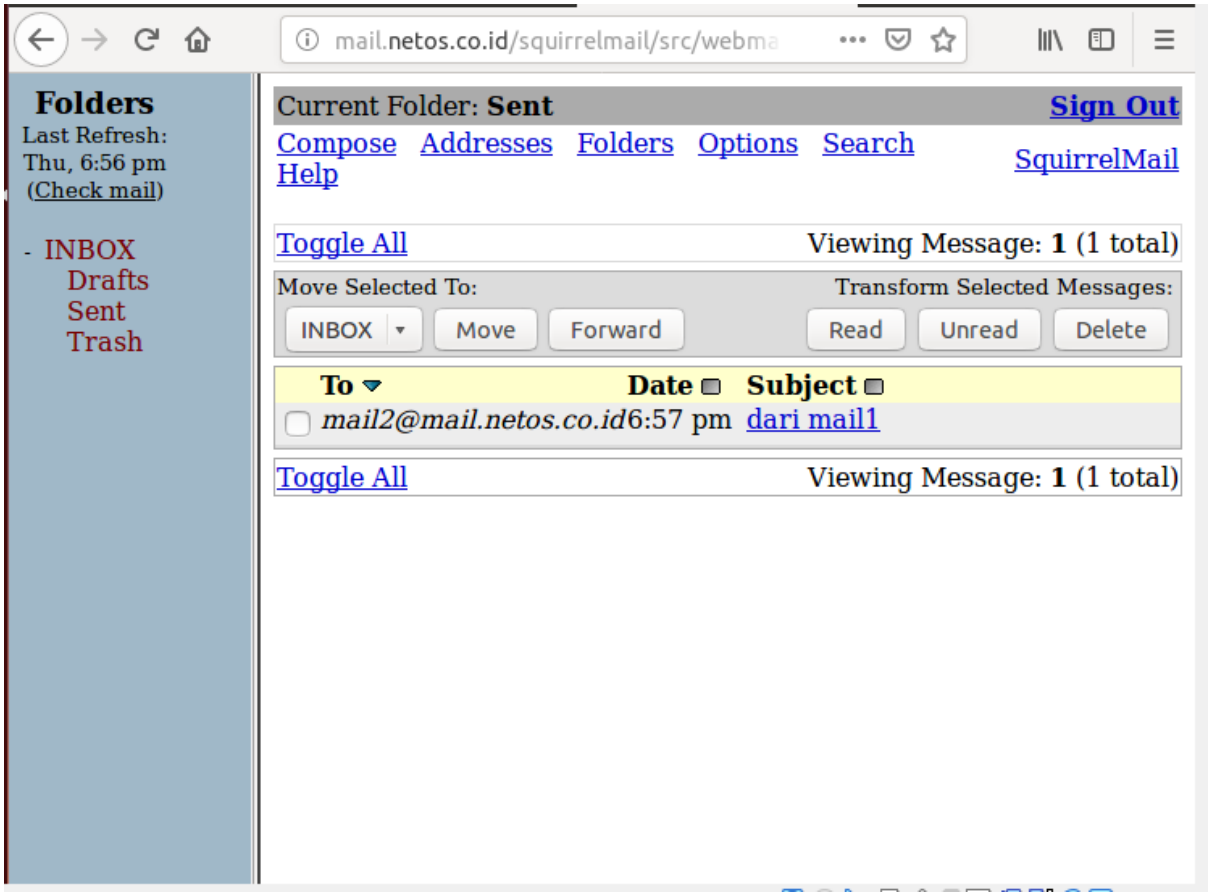
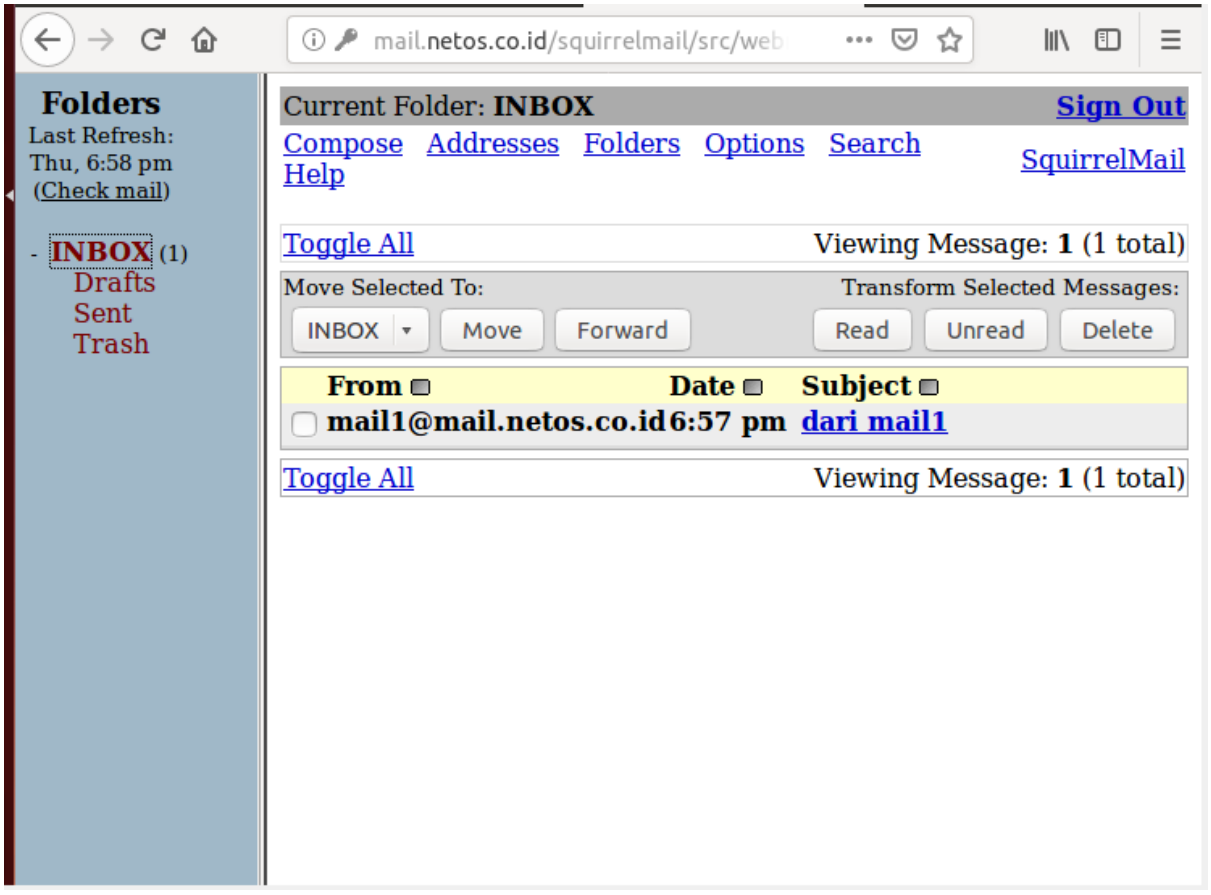
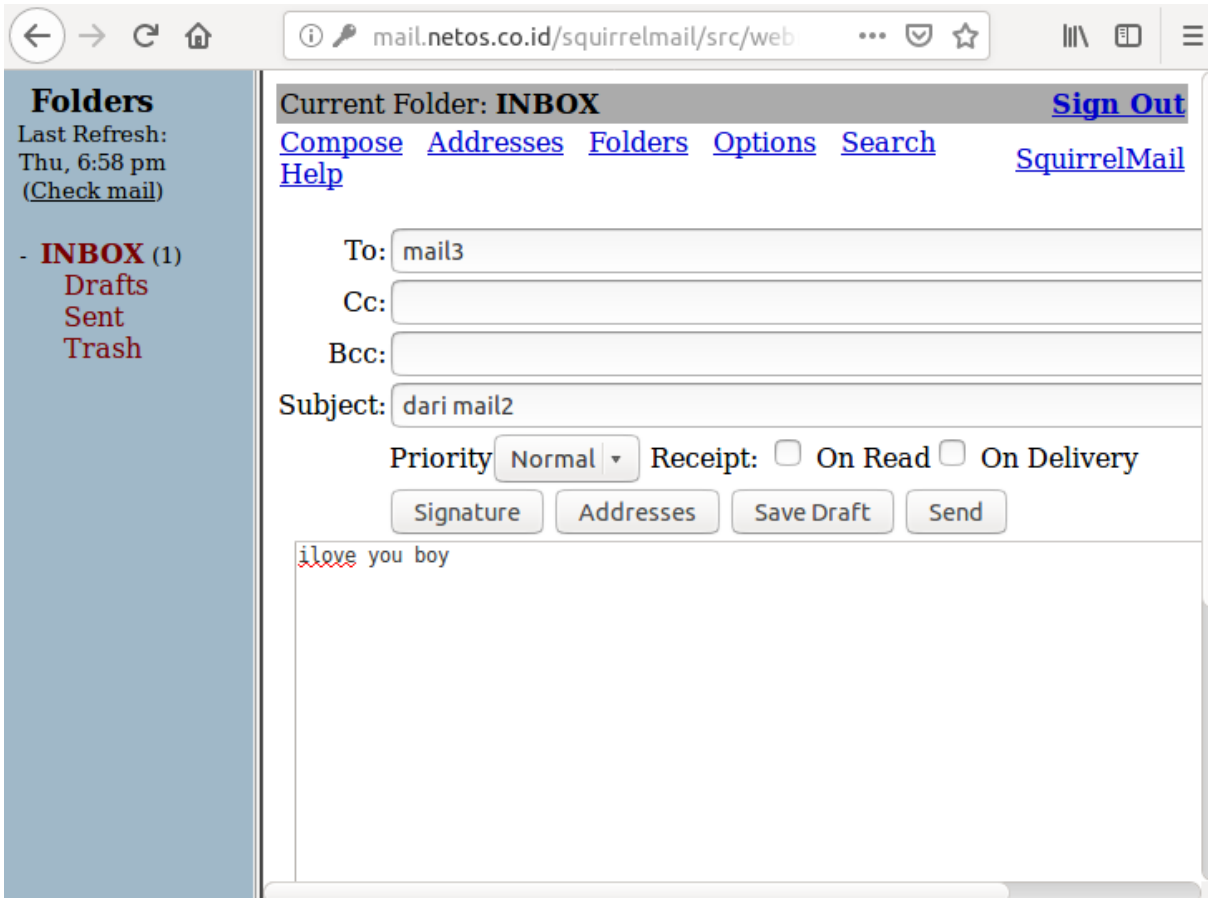
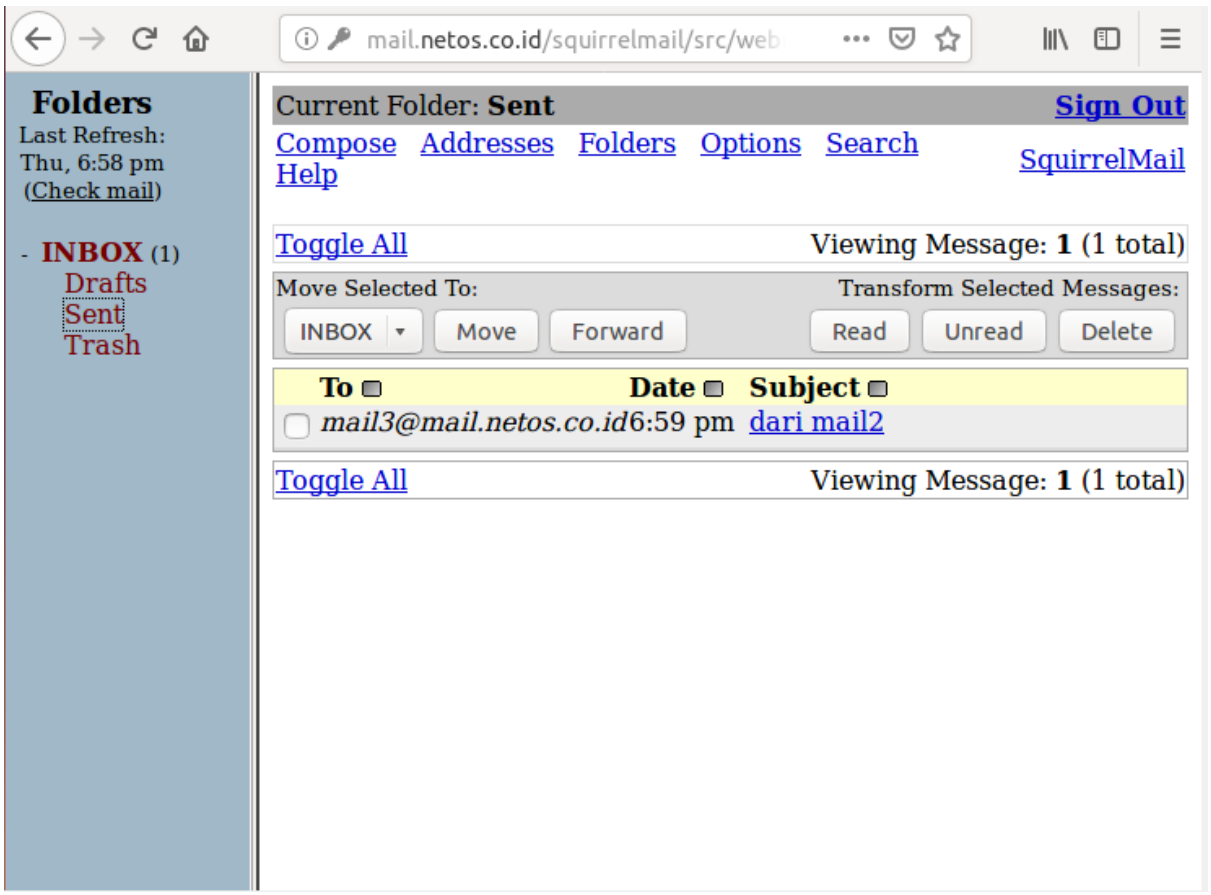
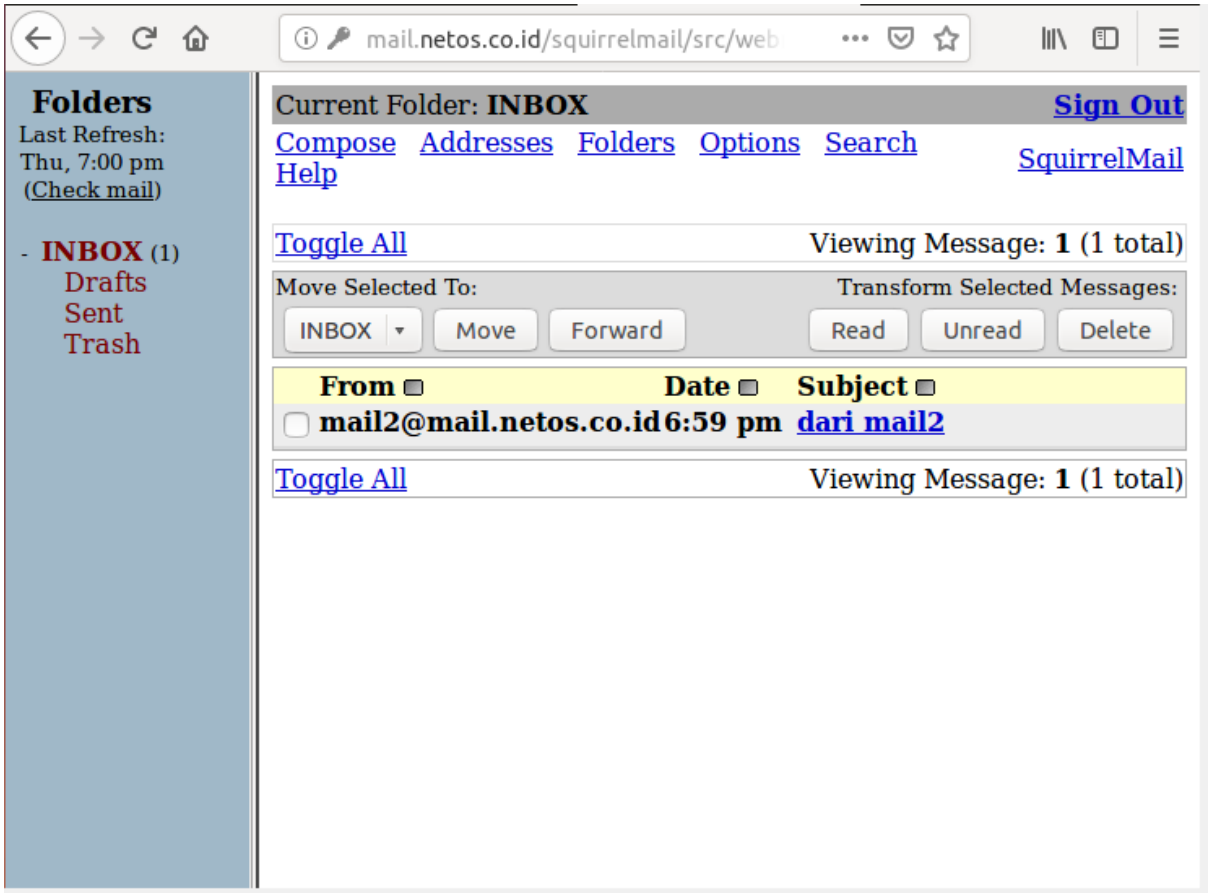
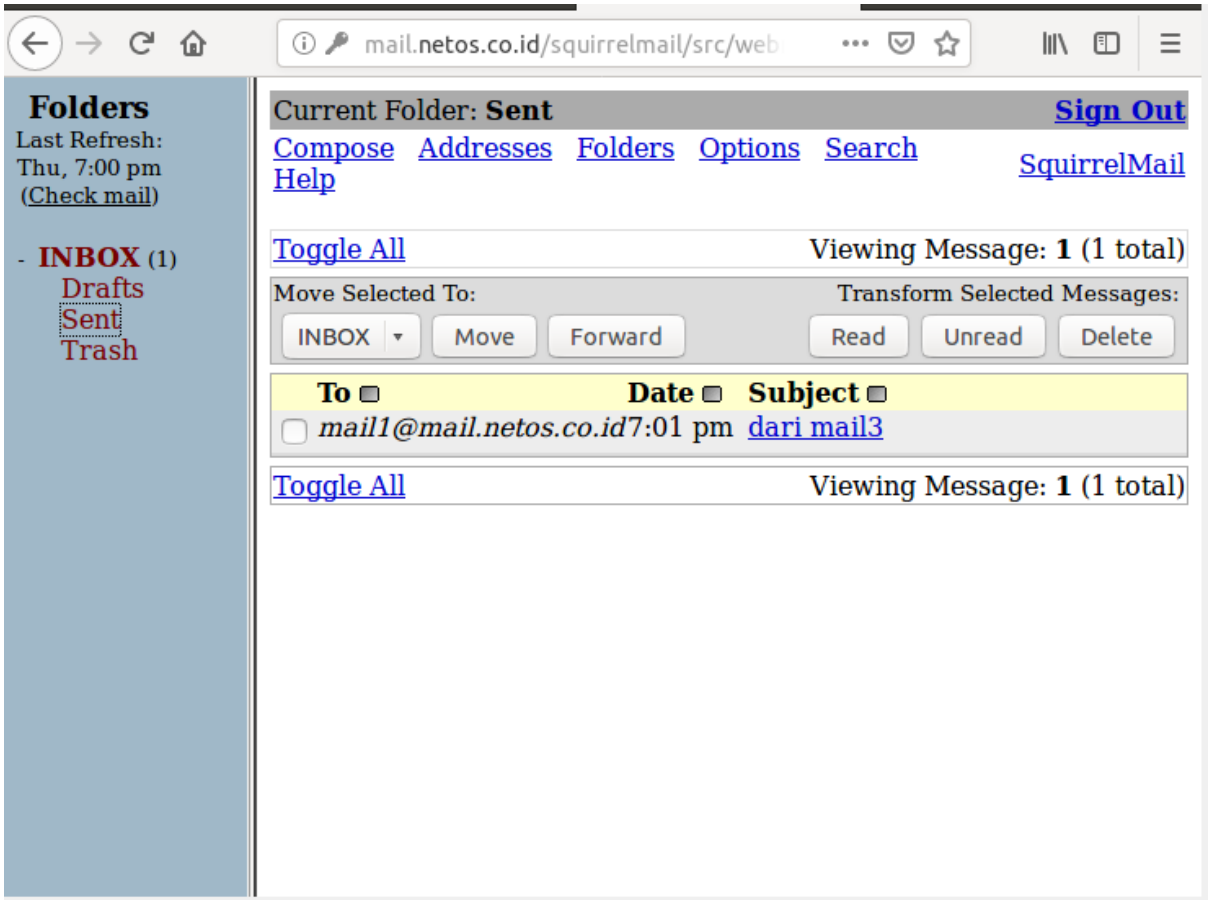

mail.netos.co.id/squirrelmail/src/webma
Folders
Last Refresh:
Thu, 6:56 pm
(Check mail)
- INBOX
Drafts
Sent
Trash
Current Folder: Sent
Sign Out
Compose Addresses Folders Options Search
Help
SquirrelMail
Toggle All
Viewing Message: 1 (1 total)
Move Selected To:
Transform Selected Messages:
INBOX
Move
Forward
Read
Unread
Delete
To
Date
Subject
mail2@mail.netos.co.id 6:57 pm
dari mail1
Toggle All
Viewing Message: 1 (1 total)


mail.netos.co.id/squirrelmail/src/web
Folders
Last Refresh:
Thu, 6:58 pm
(Check mail)
- INBOX (1)
Drafts
Sent
Trash
Current Folder: INBOX
Sign Out
Compose Addresses Folders Options Search
Help
SquirrelMail
Toggle All
Viewing Message: 1 (1 total)
Move Selected To:
Transform Selected Messages:
INBOX
Move
Forward
Read
Unread
Delete
From
Date
Subject
mail1@mail.netos.co.id 6:57 pm
dari mail1
Toggle All
Viewing Message: 1 (1 total)


mail.netos.co.id/squirrelmail/src/web
Folders
Last Refresh:
Thu, 6:58 pm
(Check mail)
- INBOX (1)
Drafts
Sent
Trash
Current Folder: INBOX
Sign Out
Compose Addresses Folders Options Search
Help
SquirrelMail
To: mail3
Cc:
Bcc:
Subject: dari mail2
Priority Normal Receipt: On Read On Delivery
Signature Addresses Save Draft Send
ilove you boy


mail.netos.co.id/squirrelmail/src/web
Folders
Last Refresh:
Thu, 6:58 pm
(Check mail)
- INBOX (1)
Drafts
Sent
Trash
Current Folder: Sent
Sign Out
Compose Addresses Folders Options Search
Help
SquirrelMail
Toggle All
Viewing Message: 1 (1 total)
Move Selected To:
Transform Selected Messages:
INBOX Move Forward Read Unread Delete
To
Date
Subject
mail3@mail.netos.co.id 6:59 pm dari mail2
Toggle All
Viewing Message: 1 (1 total)


mail.netos.co.id/squirrelmail/src/web
Folders
Last Refresh:
Thu, 7:00 pm
(Check mail)
- INBOX (1)
Drafts
Sent
Trash
Current Folder: INBOX
Sign Out
Compose Addresses Folders Options Search
Help
SquirrelMail
Toggle All
Viewing Message: 1 (1 total)
Move Selected To:
Transform Selected Messages:
INBOX
Move
Forward
Read
Unread
Delete
From
Date
Subject
mail2@mail.netos.co.id
6:59 pm
dari mail2
Toggle All
Viewing Message: 1 (1 total)


mail.netos.co.id/squirrelmail/src/web
Folders
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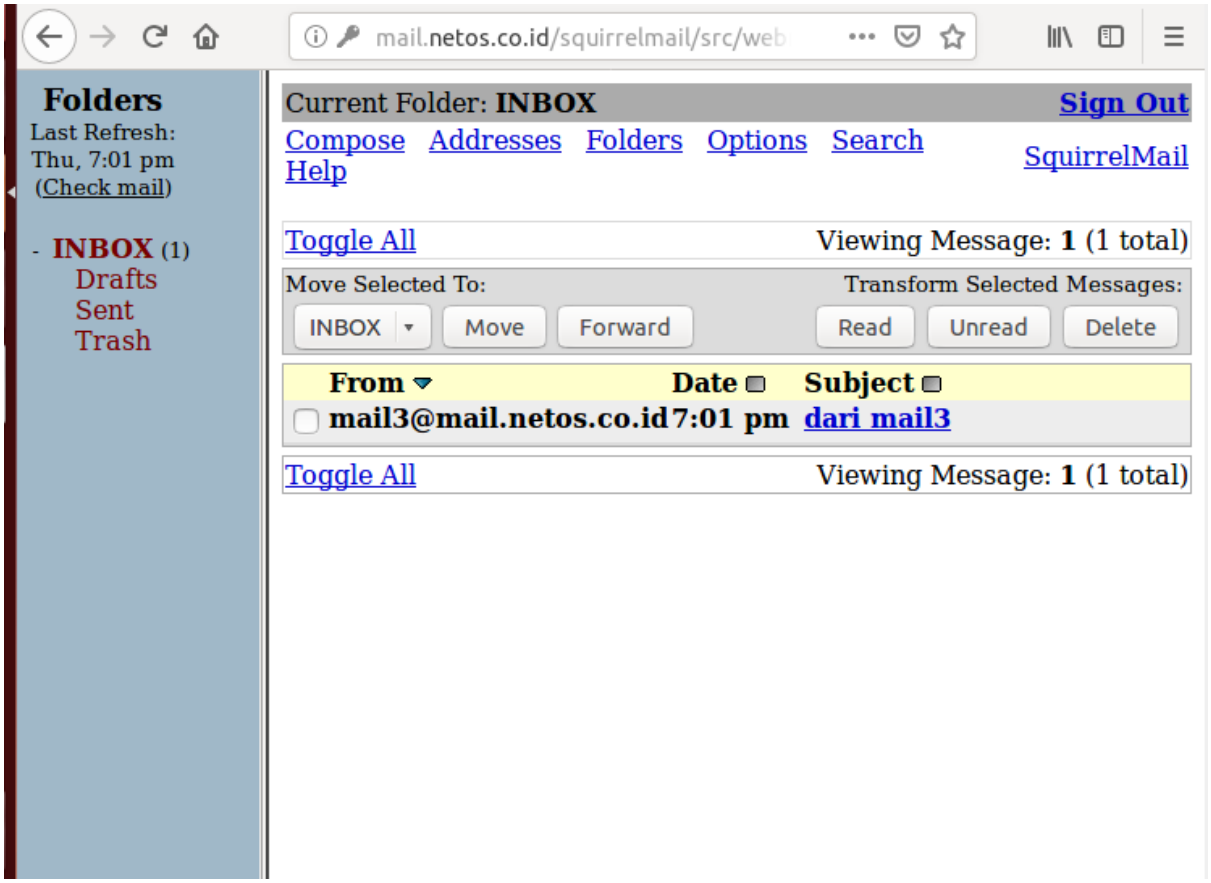
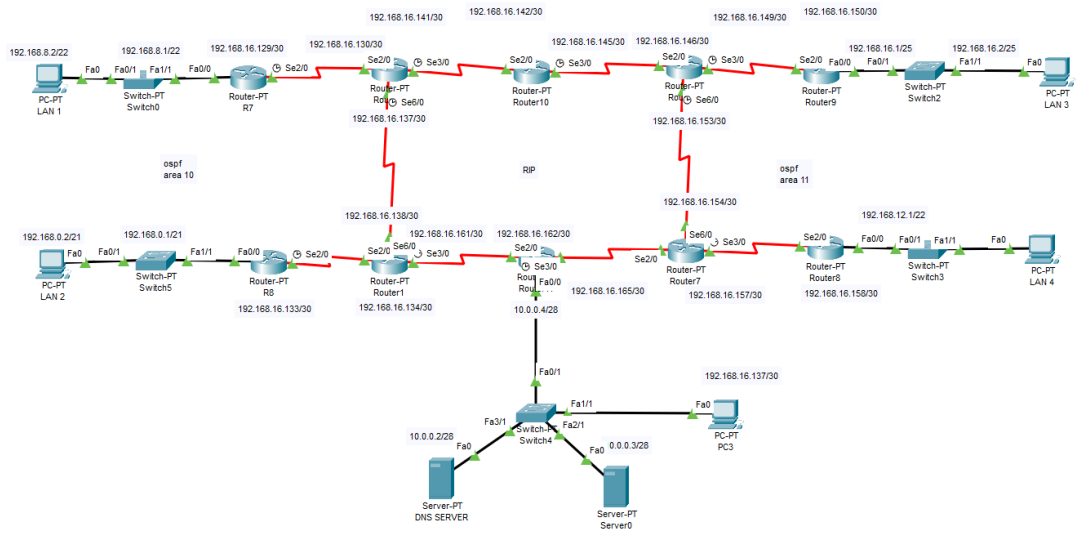
(Check mail)
- INBOX (1)
Drafts
Sent
Trash
Current Folder: Sent
Sign Out
Compose Addresses Folders Options Search
Help
SquirrelMail
Toggle All
Viewing Message: 1 (1 total)
Move Selected To:
Transform Selected Messages:
INBOX
Move
Forward
Read
Unread
Delete
To
Date
Subject
mail1@mail.netos.co.id
7:01 pm
dari mail3
Toggle All
Viewing Message: 1 (1 total)



2.7 konfigurasi router ospf dengan rip

Dimana pada gambar berikut sudah tertera setiap alamat pada setiap router



Dengan table seperti berikut subnet :

Name	Hosts Needed	Hosts Available	Unused Hosts	Network Address	Slash	Mask	Usable Range	Broadcast	Wildcard
lan2	1643	2046	403	192.168.0.0	/21	255.255.248.0	192.168.0.1 - 192.168.7.254	192.168.7.255	0.0.7.255
lan1	1022	1022	0	192.168.8.0	/22	255.255.252.0	192.168.8.1 - 192.168.11.254	192.168.11.255	0.0.3.255
lan4	786	1022	236	192.168.12.0	/22	255.255.252.0	192.168.12.1 - 192.168.15.254	192.168.15.255	0.0.3.255
lan3	80	126	46	192.168.16.0	/25	255.255.255.128	192.168.16.1 - 192.168.16.126	192.168.16.127	0.0.0.127
Host5	2	2	0	192.168.16.128	/30	255.255.255.252	192.168.16.129 - 192.168.16.130	192.168.16.131	0.0.0.3
Host6	2	2	0	192.168.16.132	/30	255.255.255.252	192.168.16.133 - 192.168.16.134	192.168.16.135	0.0.0.3
Host7	2	2	0	192.168.16.136	/30	255.255.255.252	192.168.16.137 - 192.168.16.138	192.168.16.139	0.0.0.3
Host8	2	2	0	192.168.16.140	/30	255.255.255.252	192.168.16.141 - 192.168.16.142	192.168.16.143	0.0.0.3
Host9	2	2	0	192.168.16.144	/30	255.255.255.252	192.168.16.145 - 192.168.16.146	192.168.16.147	0.0.0.3
Host10	2	2	0	192.168.16.148	/30	255.255.255.252	192.168.16.149 - 192.168.16.150	192.168.16.151	0.0.0.3
Host11	2	2	0	192.168.16.152	/30	255.255.255.252	192.168.16.153 - 192.168.16.154	192.168.16.155	0.0.0.3
Host12	2	2	0	192.168.16.156	/30	255.255.255.252	192.168.16.157 - 192.168.16.158	192.168.16.159	0.0.0.3

Dan hasil seperti berikut :

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	LAN 1	R7	ICMP		0.000	N	0	(edit)	(delete)
	Successful	LAN 1	R6	ICMP		0.000	N	1	(edit)	(delete)
	Successful	LAN 1	R3	ICMP		0.000	N	2	(edit)	(delete)

	Successful	LAN 1	R3	ICMP		0.000	N	2	(edit)	(delete)
	Successful	LAN 1	R8	ICMP		0.000	N	3	(edit)	(delete)
	Successful	LAN 1	LAN 2	ICMP		0.000	N	4	(edit)	(delete)

	Successful	R7	R6	ICMP		0.000	N	0	(edit)	(delete)
	Successful	R7	R5	ICMP		0.000	N	1	(edit)	(delete)
	Successful	R7	R4	ICMP		0.000	N	2	(edit)	(delete)

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	R8	R1	ICMP		0.000	N	0	(edit)	(delete)
	Successful	R10	R5	ICMP		0.000	N	1	(edit)	(delete)
	Failed	R8	R4	ICMP		0.000	N	2	(edit)	(delete)

BAB 3

KESIMPULAN

Dimana hasil dari tugas yang saya kerjakan masih kurang maksimal karena saya juga masih belajar khususnya pada bagaian mail server yang menurut saya kurang maksimal dan utnuk routing dimana penggabungan routing ospf masih belum bisa ping antar PC

DAFTAR PUSTAKA

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