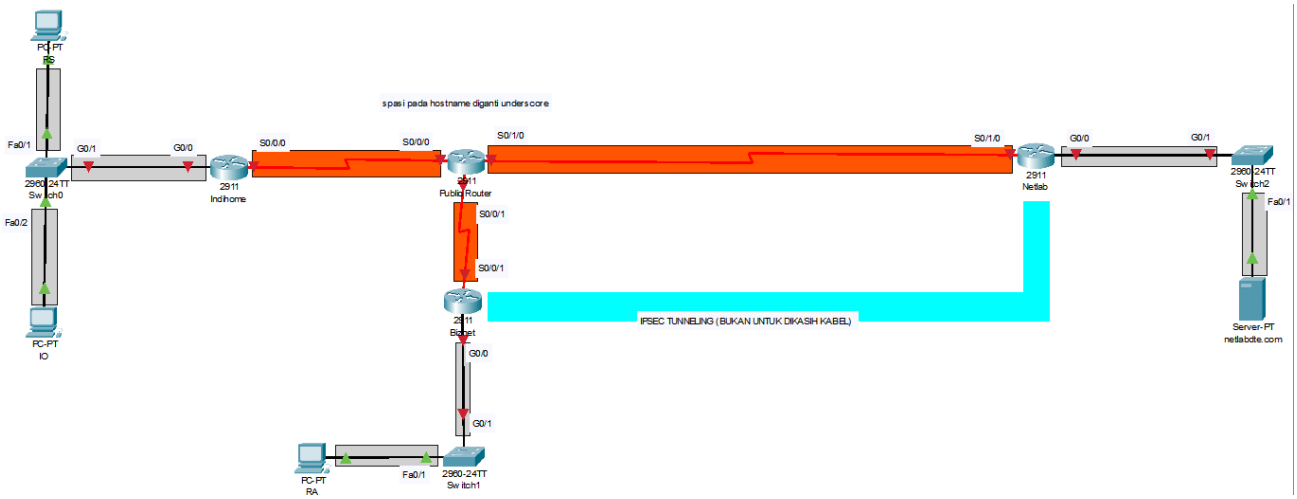
PRAKTIKUM
DESAIN DAN MANAJEMEN JARINGAN KOMPUTER

Nama	**Aliyah Rizky Al-Afifah Polanda**	**No. Modul**	**05**
NPM	**2206024682**	**Tipe**	**Case Study**

1. Menghubungkan perangkat.



2. Hostname.

```
Router(config)#host Biznet
Biznet(config)#
Router(config)#host Public_Router
Public_Router(config)#
Switch(config)#host Switch2
Switch2(config)#
```

```
Router(config)#host Netlab
Netlab(config)#
Switch(config)#host Switch0
Switch0(config)#
```

```
Router(config)#host Indihome
Indihome(config)#
Switch(config)#host Switch1
Switch1(config)#
```

3. Pengalamatan IP.

- Biznet:

```
Biznet(config)#int g0/0
Biznet(config-if)#ip add 192.168.1.1 255.255.255.0
Biznet(config-if)#no sh
Biznet(config-if)#int s0/0/1
Biznet(config-if)#ip add 10.1.7.2 255.255.255.252
Biznet(config-if)#no sh
```

- Netlab:

```
Netlab(config)#int g0/0
Netlab(config-if)#ip add 192.168.72.1 255.255.255.0
Netlab(config-if)#no sh
```

```
Netlab(config-if)#int s0/1/0
Netlab(config-if)#ip add 10.7.2.2 255.255.255.252
Netlab(config-if)#no sh
```

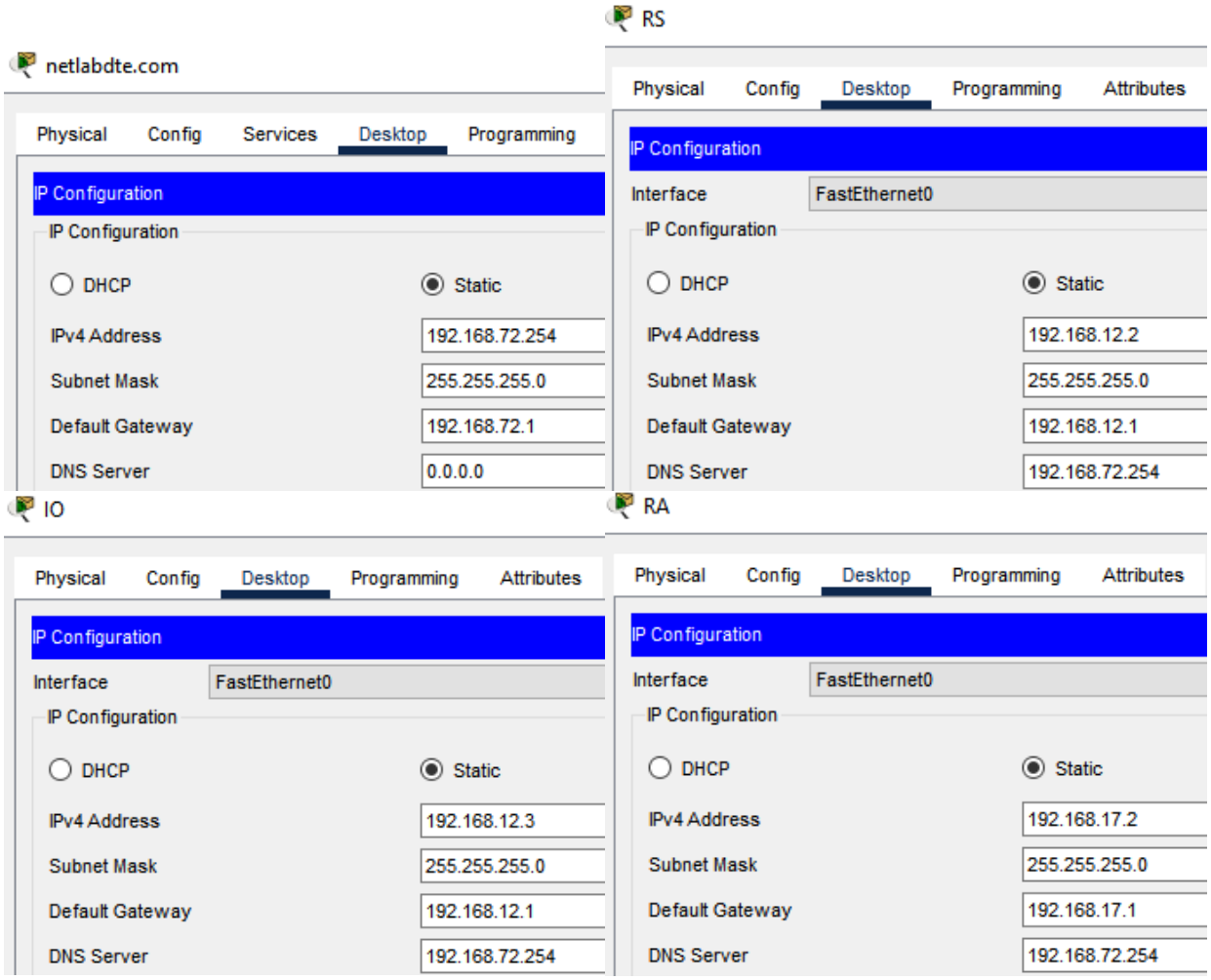
- Indihome:

```
Indihome(config)#int g0/0
Indihome(config-if)#ip add 192.168.12.1 255.255.255.0
Indihome(config-if)#no sh
Indihome(config-if)#int s0/0/0
Indihome(config-if)#ip add 10.1.2.2 255.255.255.252
Indihome(config-if)#no sh
```

- Public_Router:

```
Public_Router(config)#int s0/0/0
Public_Router(config-if)#ip add 10.1.2.1 255.255.255.252
Public_Router(config-if)#no sh
Public_Router(config-if)#int s0/0/1
Public_Router(config-if)#ip add 10.1.7.1 255.255.255.252
Public_Router(config-if)#no sh
Public_Router(config-if)#int s0/1/0
Public_Router(config-if)#ip add 10.7.2.1 255.255.255.252
Public_Router(config-if)#no sh
```

- End devices:



Routing

4. Konfigurasi EIGRP.
   - Biznet:

```
Biznet(config)#router eigrp 10
Biznet(config-router)#net 192.168.17.0 0.0.0.255
Biznet(config-router)#net 10.1.7.0 0.0.0.3
Biznet(config-router)#passive g0/0
Biznet(config-router)#no auto
```

   - Netlab:

```
Netlab(config)#router eigrp 10
Netlab(config-router)#net 192.168.72.0 0.0.0.255
Netlab(config-router)#net 10.7.2.0 0.0.0.3
Netlab(config-router)#passive g0/0
Netlab(config-router)#no auto
```

   - Indihome:

```
Indihome(config)#router eigrp 10
Indihome(config-router)#net 192.168.12.0 0.0.0.255
Indihome(config-router)#net 10.1.2.0 0.0.0.3
Indihome(config-router)#passive g0/0
Indihome(config-router)#no auto
```

   - Public_router:

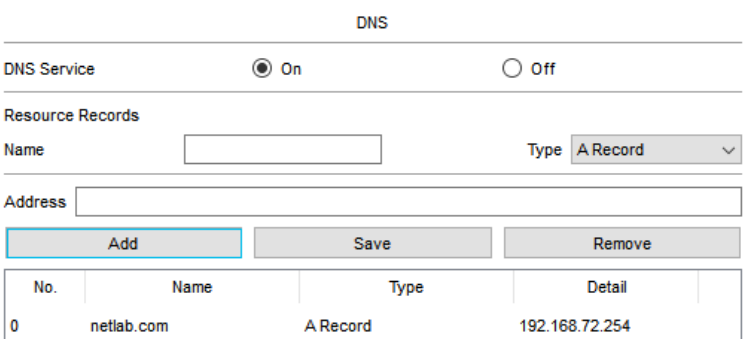
```
Public_Router(config)#router eigrp 10
Public_Router(config-router)#net 10.1.2.0 0.0.0.3
Public_Router(config-router)#net 10.1.7.0 0.0.0.3
Public_Router(config-router)#net 10.7.2.0 0.0.0.3
Public_Router(config-router)#no auto
```

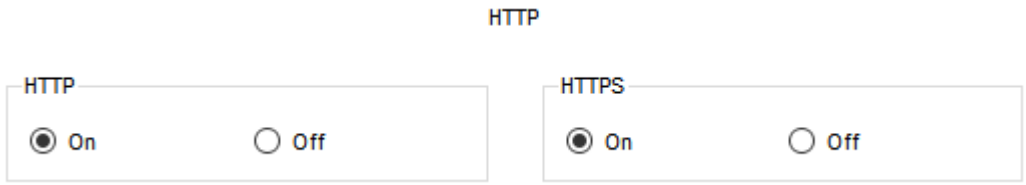
5. Tes routing.

Last Status	Source	Destination
Successful	IO	netlabdte.com
Successful	netlabdte...	RS

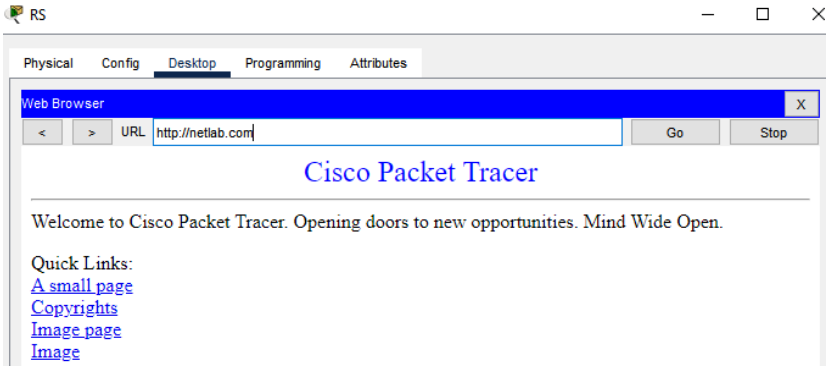
Konfigurasi DNS & Web Server

6. Aktifkan server.





7. Tes web server.



Main part: Konfigurasi IPSEC VPN

8. Modul securityk9:
   - Netlab:

```
Netlab(config)#license boot module c2900 technology-package securityk9
% use 'write' command to make license boot config take effect on next boot
%LICENSE-6-EULA_ACCEPTED: EULA for feature securityk9 1.0 has been accepted.
UDI=CISCO2911/K9:FTX1524C5GJ-; StoreIndex=0:Evaluation License Storage
Netlab(config)#: %IOS_LICENSE_IMAGE_APPLICATION-6-LICENSE_LEVEL: Module name = C2900 Next
reboot level = securityk9 and License = securityk9
```

   - Biznet:

```
Biznet(config)#license boot module c2900 technology-package securityk9
PLEASE  READ THE  FOLLOWING TERMS  CAREFULLY. INSTALLING THE LICENSE OR
```

9. Memastikan hasil.
   - Netlab:

```
Netlab#sh lic fea
Feature name      Enforcement  Evaluation  Subscription   Enabled  RightToUse
ipbasek9          no           no          no             yes      no
securityk9        yes          yes         no             yes      yes
datak9            yes          no          no             no       yes
uck9              yes          yes         no             no       yes
```

   - Biznet:

```
Biznet#sh lic fe
Feature name      Enforcement  Evaluation  Subscription   Enabled  RightToUse
ipbasek9          no           no          no             yes      no
securityk9        yes          yes         no             yes      yes
datak9            yes          no          no             no       yes
uck9              yes          yes         no             no       yes
```

Aktivasi IPSec pada router Biznet dan Netlab

10. Konfigurasi ISAKMP phase 1.

```
Biznet(config)#crypto isakmp policy 1
Biznet(config-isakmp)#encryption 3des
Biznet(config-isakmp)#hash md5
Biznet(config-isakmp)#authentication pre-share
Biznet(config-isakmp)#group 2
Biznet(config-isakmp)#lifetime 86400
Biznet(config)#crypto isakmp key cisco address 10.7.2.2
```

11. Konfigurasi ISAKMP phase 2.

```
Biznet(config)#crypto ipsec transform-set VPN-SET esp-3des esp-md5-hmac

Biznet(config)#ip access-list extended VPN-TRAFFIC
Biznet(config-ext-nacl)#permit ip 192.168.17.0 0.0.0.255 192.168.72.0 0.0.0.255

Biznet(config)#crypto map VPN-MAP 2 ipsec-isakmp

Biznet(config-crypto-map)#set peer 10.7.2.2
Biznet(config-crypto-map)#set transform-set VPN-SET
Biznet(config-crypto-map)#match address VPN-TRAFFIC
```

12. Konfigurasi di interface.

```
Biznet(config)#int s0/0/1

Biznet(config-if)#crypto map VPN-MAP
```

13. Konfigurasi di Netlab.

- Phase 1:

```
Netlab(config)#crypto isakmp policy 1
Netlab(config-isakmp)#encryption 3des
Netlab(config-isakmp)#hash md5
Netlab(config-isakmp)#authentication pre-share
Netlab(config-isakmp)#group 2

Netlab(config-isakmp)#lifetime 86400

Netlab(config)#crypto isakmp key cisco address 10.1.7.2
```

- Phase 2:

```
Netlab(config)#crypto ipsec transform-set VPN-SET esp-3des esp-md5-hmac
Netlab(config)#ip access-list extended VPN-TRAFFIC
Netlab(config-ext-nacl)#permit ip 192.168.72.0 0.0.0.255 192.168.17.0 0.0.0.255

Netlab(config-crypto-map)#set peer 10.1.7.2
Netlab(config-crypto-map)#set transform-set VPN-SET
Netlab(config-crypto-map)#match address VPN-TRAFFIC
```

- Konfigurasi di interface:

```
Netlab(config)#int s0/1/0
Netlab(config-if)#crypto map VPN-MAP
```

Verifikasi Kondigurasi dari IPSec VPN

14. Hasil.

- Biznet:

```
Biznet#show crypto ipsec sa

interface: Serial0/0/1
    Crypto map tag: VPN-MAP, local addr 10.1.7.2

   protected vrf: (none)
   local  ident (addr/mask/prot/port): (192.168.17.0/255.255.255.0/0/0)
   remote  ident (addr/mask/prot/port): (192.168.72.0/255.255.255.0/0/0)
   current_peer 10.7.2.2 port 500
    PERMIT, flags={origin_is_acl,}
   #pkts encaps: 0, #pkts encrypt: 0, #pkts digest: 0
   #pkts decaps: 0, #pkts decrypt: 0, #pkts verify: 0
   #pkts compressed: 0, #pkts decompressed: 0
   #pkts not compressed: 0, #pkts compr. failed: 0
   #pkts not decompressed: 0, #pkts decompress failed: 0
   #send errors 0, #recv errors 0

     local crypto endpt.: 10.1.7.2, remote crypto endpt.:10.7.2.2
     path mtu 1500, ip mtu 1500, ip mtu idb Serial0/0/1
     current outbound spi: 0x0(0)

     inbound esp sas:

     inbound ah sas:

     inbound pcp sas:

     outbound esp sas:

     outbound ah sas:

     outbound pcp sas:
```

- Netlab:

```
Netlab#show crypto ipsec sa

interface: Serial0/1/0
    Crypto map tag: VPN-MAP, local addr 10.7.2.2

   protected vrf: (none)
   local  ident (addr/mask/prot/port): (192.168.72.0/255.255.255.0/0/0)
   remote  ident (addr/mask/prot/port): (192.168.17.0/255.255.255.0/0/0)
   current_peer 10.1.7.2 port 500
    PERMIT, flags={origin_is_acl,}
   #pkts encaps: 0, #pkts encrypt: 0, #pkts digest: 0
   #pkts decaps: 0, #pkts decrypt: 0, #pkts verify: 0
   #pkts compressed: 0, #pkts decompressed: 0
   #pkts not compressed: 0, #pkts compr. failed: 0
   #pkts not decompressed: 0, #pkts decompress failed: 0
   #send errors 0, #recv errors 0

     local crypto endpt.: 10.7.2.2, remote crypto endpt.:10.1.7.2
     path mtu 1500, ip mtu 1500, ip mtu idb Serial0/1/0
     current outbound spi: 0x0(0)

     inbound esp sas:

     inbound ah sas:

     inbound pcp sas:

     outbound esp sas:

     outbound ah sas:

     outbound pcp sas:
```

15. Analisis.

```
#pkts encaps: 0, #pkts encrypt: 0,
#pkts decaps: 0, #pkts decrypt: 0,
```

Untuk enkapsulasi, dekapsulasi, enkripsi, dan dekripsi, belum ada nilainya. Hal ini karena belum ada pertukaran paket yang melewati tunnel, sehingga belum ada paket yang dapat diterapkan 4 proses tersebut. Jika paket telah dipertukarkan, maka nilai tersebut akan berubah.

16. Ping-t

```
C:\>ping -t 192.168.72.254

Pinging 192.168.72.254 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
```

Ping gagal karena saat EIGRP, routing antara netlab.com ke RA belum berhasil.

17. Hasil.

- Biznet:

```
Biznet#show crypto ipsec sa

interface: Serial0/0/1
    Crypto map tag: VPN-MAP, local addr 10.1.7.2

   protected vrf: (none)
   local  ident (addr/mask/prot/port): (192.168.17.0/255.255.255.0/0/0)
   remote  ident (addr/mask/prot/port): (192.168.72.0/255.255.255.0/0/0)
   current_peer 10.7.2.2 port 500
    PERMIT, flags={origin_is_acl,}
   #pkts encaps: 0, #pkts encrypt: 0, #pkts digest: 0
   #pkts decaps: 0, #pkts decrypt: 0, #pkts verify: 0
   #pkts compressed: 0, #pkts decompressed: 0
   #pkts not compressed: 0, #pkts compr. failed: 0
   #pkts not decompressed: 0, #pkts decompress failed: 0
   #send errors 0, #recv errors 0

     local crypto endpt.: 10.1.7.2, remote crypto endpt.:10.7.2.2
     path mtu 1500, ip mtu 1500, ip mtu idb Serial0/0/1
     current outbound spi: 0x0(0)

     inbound esp sas:

     inbound ah sas:

     inbound pcp sas:

     outbound esp sas:

     outbound ah sas:

     outbound pcp sas:
```

- Netlab:

```
Netlab#show crypto ipsec sa

interface: Serial0/1/0
    Crypto map tag: VPN-MAP, local addr 10.7.2.2

   protected vrf: (none)
   local  ident (addr/mask/prot/port): (192.168.72.0/255.255.255.0/0/0)
   remote  ident (addr/mask/prot/port): (192.168.17.0/255.255.255.0/0/0)
   current_peer 10.1.7.2 port 500
    PERMIT, flags={origin_is_acl,}
   #pkts encaps: 0, #pkts encrypt: 0, #pkts digest: 0
   #pkts decaps: 0, #pkts decrypt: 0, #pkts verify: 0
   #pkts compressed: 0, #pkts decompressed: 0
   #pkts not compressed: 0, #pkts compr. failed: 0
   #pkts not decompressed: 0, #pkts decompress failed: 0
   #send errors 0, #recv errors 0

     local crypto endpt.: 10.7.2.2, remote crypto endpt.:10.1.7.2
     path mtu 1500, ip mtu 1500, ip mtu idb Serial0/1/0
     current outbound spi: 0x0(0)

     inbound esp sas:

     inbound ah sas:

     inbound pcp sas:

     outbound esp sas:

     outbound ah sas:

     outbound pcp sas:
```

18. Tracer route.

- RA:

```
C:\>tracert 192.168.72.254

Tracing route to 192.168.72.254 over a maximum of 30 hops:

  1    *        *        *        Request timed out.
  2    *        *        *        Request timed out.
  3    *        *        *        Request timed out.
```

- RS:

RS

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>tracert 192.168.72.254

Tracing route to 192.168.72.254 over a maximum of 30 hops:

  1    0 ms      0 ms      0 ms      192.168.12.1
  2    2 ms      1 ms      1 ms      10.1.2.1
  3    1 ms      1 ms      0 ms      10.7.2.2
  4    10 ms     1 ms      1 ms      192.168.72.254

Trace complete.
```

- IO:

IO

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>tracert 192.168.72.254

Tracing route to 192.168.72.254 over a maximum of 30 hops:

  1    0 ms      0 ms      1 ms      192.168.12.1
  2    0 ms      0 ms      10 ms     10.1.2.1
  3    11 ms     0 ms      0 ms      10.7.2.2
  4    *         42 ms     12 ms     192.168.72.254

Trace complete.
```

Analisis:

Tracer route dari RS dan IO berhasil, hal ini karena routing EIGRP telah berhasil berjalan, sehingga rute dapat ditemukan. Sedangkan jika dari RA, tidak berhasil karena rute tidak ditemukan (Routing gagal).