

# OSPF OVER L2TP

---

# Tujuan

Adapun tujuan dari presentasi ini adalah

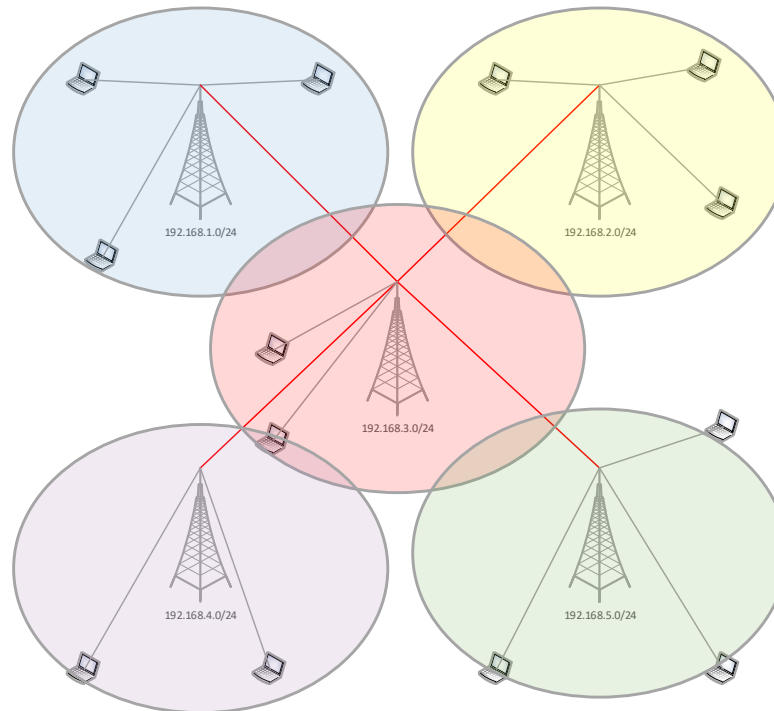
- Memahami konsep dasar cara kerja OSPF di Mikrotik
- Memahami Konfigurasi OSPF dengan L2TP

# Tentang Saya

- Nama : **Andy Thomas**
- dari Medan, Sumatera Utara
- Trainer di Wi-learning
- Sertifikasi :
  - MTCNA
  - MTCRE
  - MTCUME
- MUM Pertama: Jogjakarta, 2013

# Route

- Routing adalah proses untuk meneruskan paket data dari satu jaringan ke jaringan yang lain di segment yang berbeda.



# Route – cont.

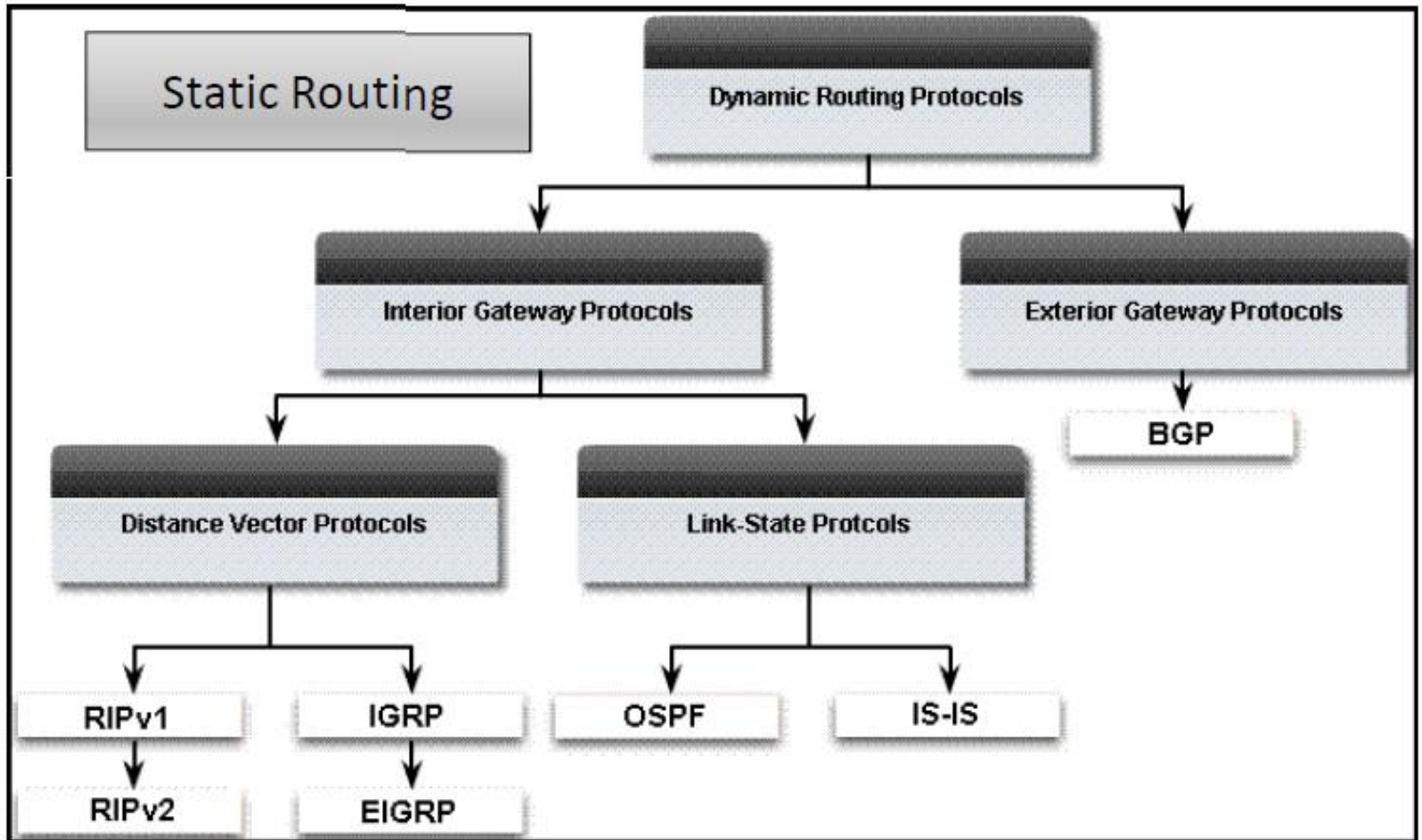
- Routing merupakan fungsi standar dari mikrotik.

```
[admin@MikroTik] > /system package print
Flags: X - disabled
#  NAME                VERSION          SCI
0  routeros-mipsbe     6.42.5
1  system               6.42.5
2  X-impf               6.42.5
3  wireless             6.42.5
4  hotspot              6.42.5
5  dhcp                 6.42.5
6  mpls                 6.42.5
7  routing              6.42.5
8  ppp                  6.42.5
9  security             6.42.5
10 advanced-tools      6.42.5
[admin@MikroTik] >
```

## Route – cont.

- Keuntungan routing :
  - Pengawasan jaringan lebih mudah.
  - Lebih aman

# Route –Cont.



# Route -Cont.

[A]ctive  
[S]tatic

[D]ynamic  
[A]ctive  
[C]onnected

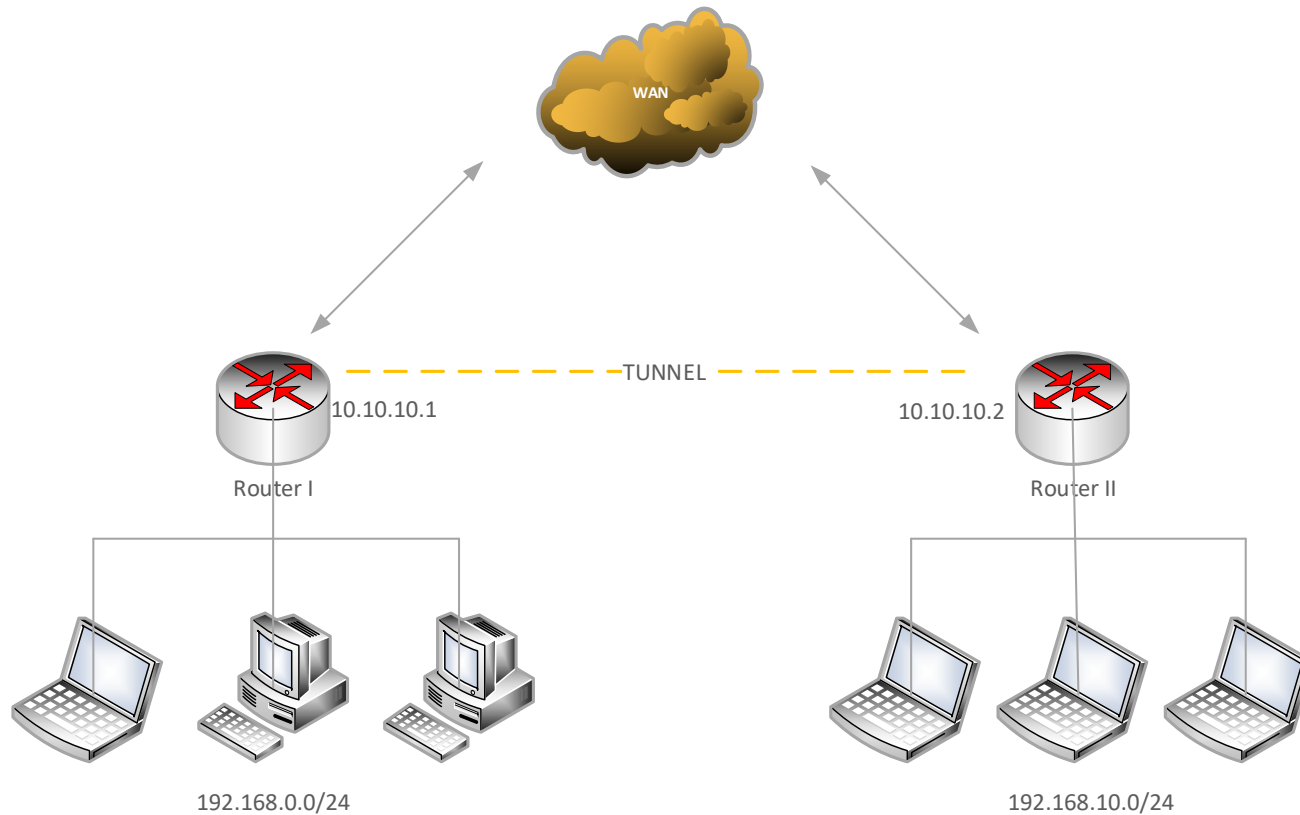
	Dst. Address	Gateway	Distance	Routing Mark
AS	0.0.0.0/0	192.168.100.1 reachable wlan1	1	
DAC	192.168.100.0	wlan1 reachable	0	1
DAC	192.168.200.0	ether1 reachable	0	1



# Tunnel

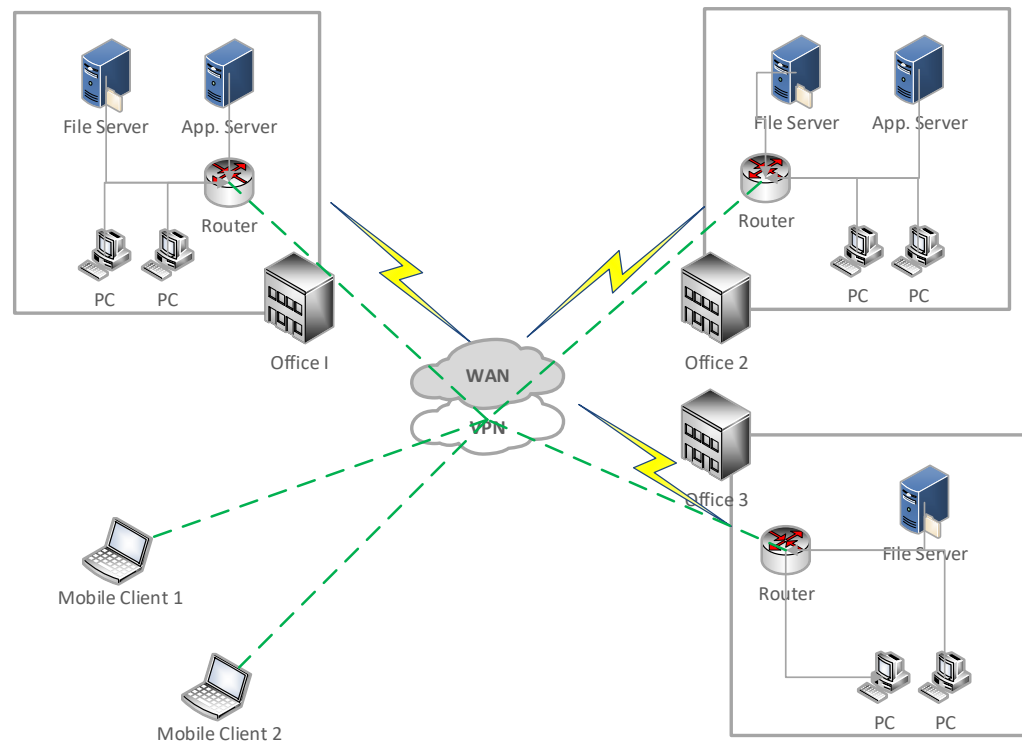
- Merupakan sebuah metode enkapsulasi paket data dalam jaringan.
- Paket Data mengalami modifikasi sebelum dikirim, yaitu penambahan header.
- Ketika data sudah melewati tunnel dan sampai di tujuan tunnel, maka header dari paket data akan dikembalikan seperti semula (header tunnel dilepas).

# Tunnel – cont.



# VPN

- Sebuah cara aman untuk mengakses local area network dengan menggunakan internet atau jaringan publik



# Tunnel And VPN

Tunnel	VPN
<ul style="list-style-type: none"><li>• IPIP</li></ul>	<ul style="list-style-type: none"><li>• PPTP</li></ul>
<ul style="list-style-type: none"><li>• PPPoE</li></ul>	<ul style="list-style-type: none"><li>• L2TP</li></ul>
<ul style="list-style-type: none"><li>• EoIP</li></ul>	<ul style="list-style-type: none"><li>• OpenVPN</li></ul>
<ul style="list-style-type: none"><li>• VLAN</li></ul>	<ul style="list-style-type: none"><li>• IPSec</li></ul>
<ul style="list-style-type: none"><li>• Gre Tunnel</li></ul>	<ul style="list-style-type: none"><li>• SSTP</li></ul>

# L2TP

- Layer 2 Tunneling Protocol
- Menggunakan Protokol UDP(Port 1701),
- Lebih aman di bandingkan PPTP

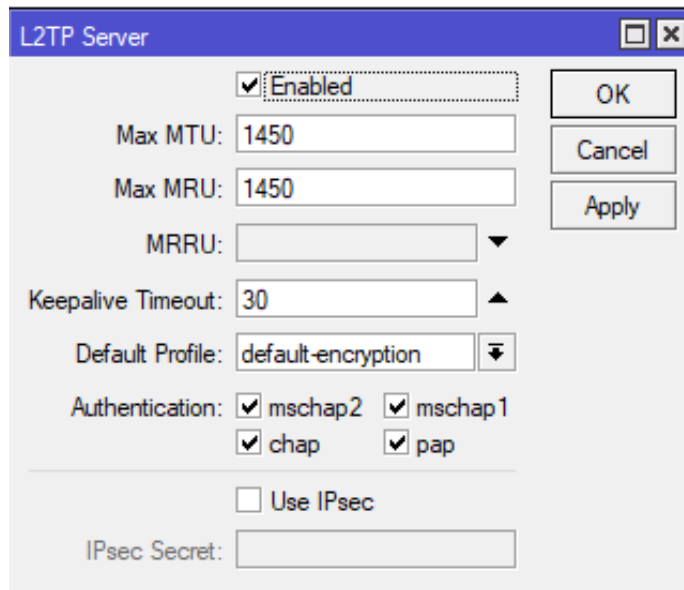
# L2TP – *cont.*

- Membuat Server L2TP
  - Basis Perintah

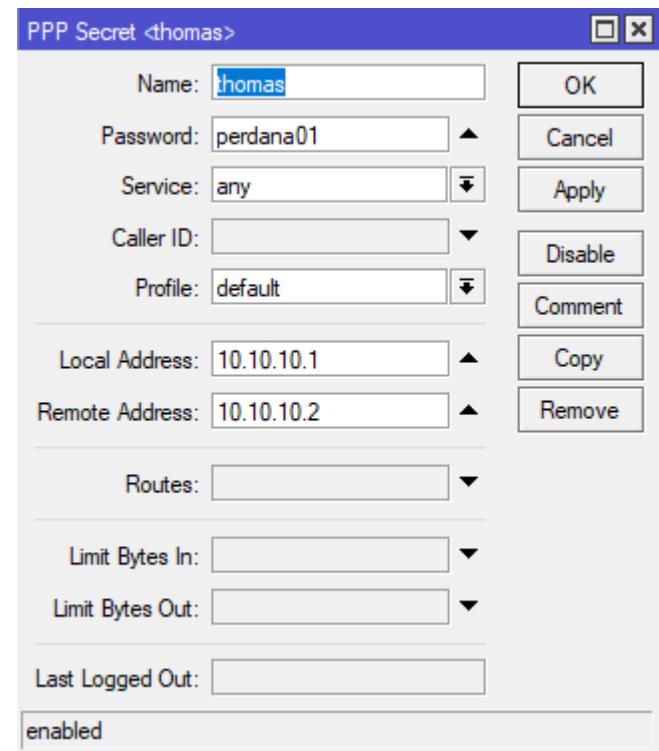
```
[admin@MikroTik] > interface l2tp-server server set enabled=yes  
[admin@MikroTik] > /ppp secret add name=thomas password=perdana01 local-address=10  
.10.10.1 remote-address=10.10.10.2
```

# L2TP – cont.

- Winbox



The screenshot shows the 'L2TP Server' configuration window. The 'Enabled' checkbox is checked. The 'Max MTU' and 'Max MRU' fields are both set to 1450. The 'MRRU' field is empty with a dropdown arrow. The 'Keepalive Timeout' is set to 30. The 'Default Profile' is set to 'default-encryption'. Under 'Authentication', the checkboxes for 'mschap2', 'mschap1', 'chap', and 'pap' are all checked. The 'Use IPsec' checkbox is unchecked. The 'IPsec Secret' field is empty.



The screenshot shows the 'PPP Secret <thomas>' configuration window. The 'Name' field is 'thomas'. The 'Password' field is 'perdana01'. The 'Service' is set to 'any'. The 'Caller ID' field is empty. The 'Profile' is set to 'default'. The 'Local Address' is '10.10.10.1' and the 'Remote Address' is '10.10.10.2'. The 'Routes' field is empty. The 'Limit Bytes In' and 'Limit Bytes Out' fields are empty. The 'Last Logged Out' field is empty. The status at the bottom is 'enabled'.

# L2TP – cont.

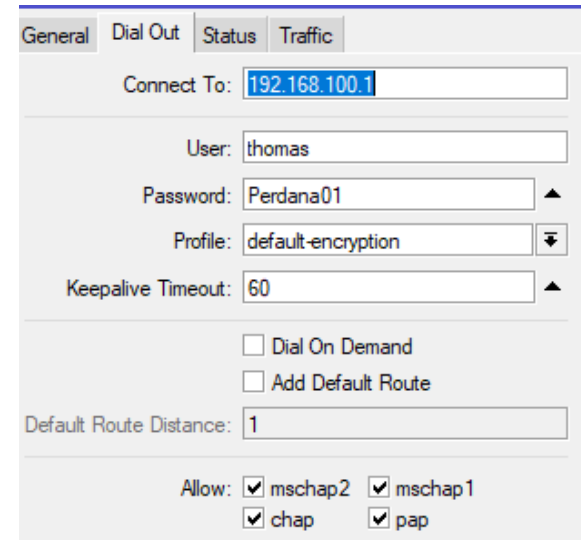
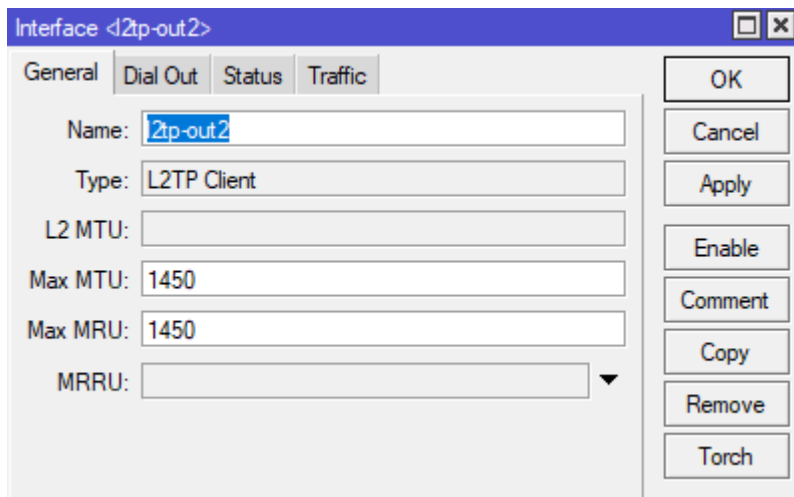
- L2TP Client
  - Basis Perintah

```
[admin@MikroTik] > /interface l2tp-client add user=thomas password=Perdana01 connect-to=192.168.100.1
[admin@MikroTik] > /interface l2tp-client print
Flags: X - disabled, R - running
0 X name="l2tp-out2" max-mtu=1450 max-mru=1450 mrru=disabled connect-to=192.168.100.1
  user="thomas" password="Perdana01" profile=default-encryption keepalive-timeout=60
  add-default-route=no dial-on-demand=no allow=pap,chap,mschap1,mschap2
```



# L2TP – cont.

- Winbox

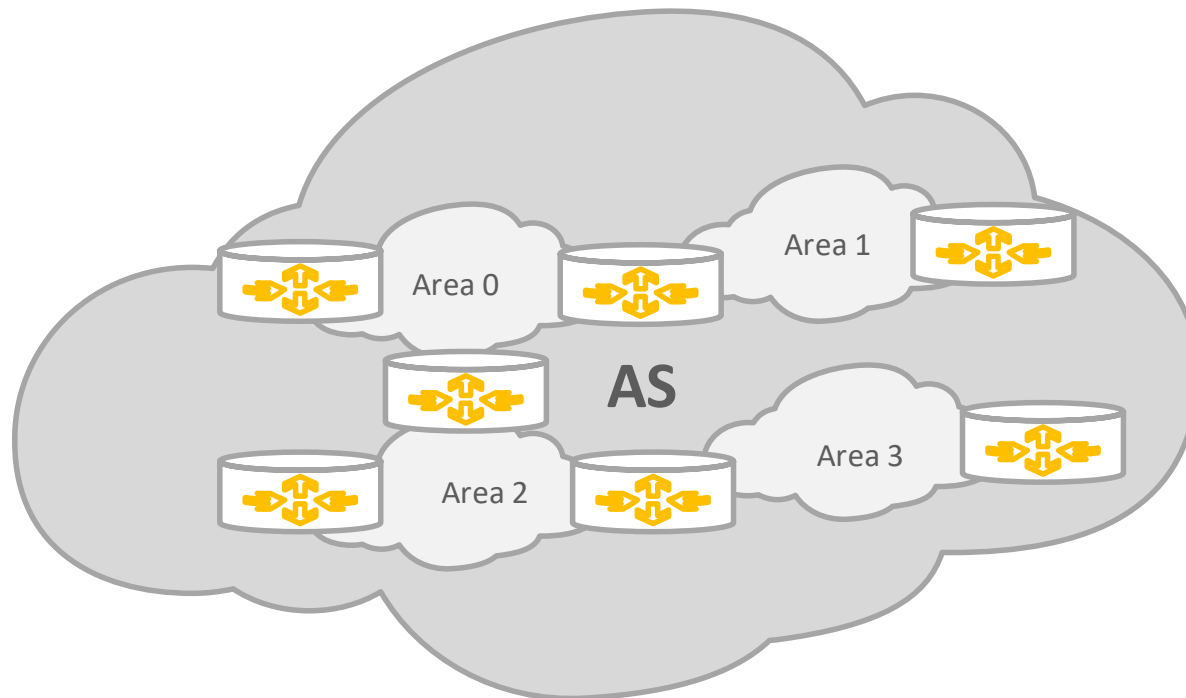


# OSPF

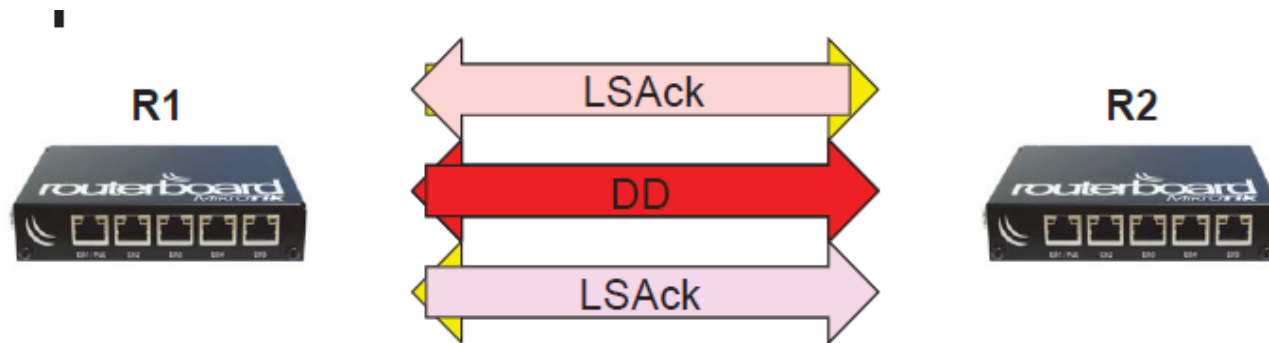
- Open Shortest Path First.
- Merupakan protocol routing otomatis yang memiliki kemampuan untuk menjaga, memelihara dan mendistribusikan informasi routing antar jaringan.
- Termasuk didalam IGP(Interior Gateway Protocol)
- Menggunakan Protokol 89.

# OSPF – cont.

- Kenapa menggunakan OSPF?



# OSPF – Discovery Process

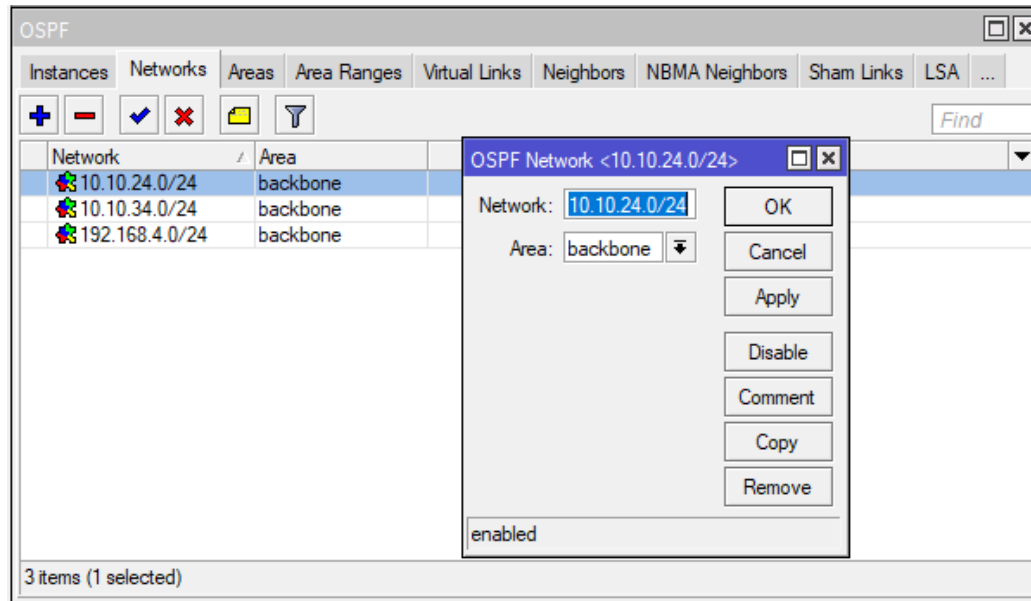


	Neighbor	State
1		DOWN
2		
3	R2	2-WAY
4	R2	ExStart
6	R2	ExChange
8	R2	Loading
10	R2	Full

	Neighbor	State
1		DOWN
2	R1	INIT
3		
5	R1	ExStart
7	R1	ExChange
9	R1	Loading
10	R1	Full

# OSPF - cont.

```
[admin@Branch] > /routing ospf network add network=10.10.24.0/24 area=backbone
[admin@Branch] > /routing ospf network print
Flags: X - disabled, I - invalid
#  NETWORK          AREA
0  10.10.34.0/24    backbone
1  192.168.4.0/24   backbone
2  10.10.24.0/24    backbone
```



# OSPF Via L2TP[Example]

- Contoh.

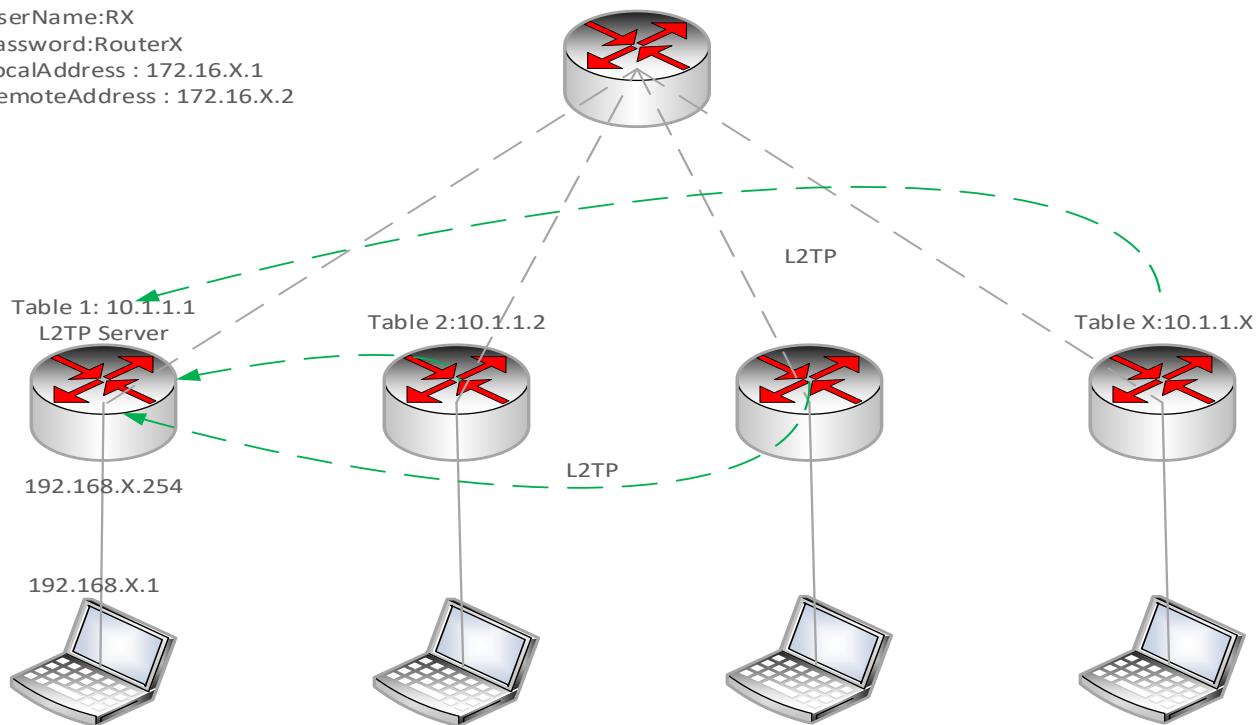
Table 1 As L2TP-Server:

UserName:RX

Password:RouterX

LocalAddress : 172.16.X.1

RemoteAddress : 172.16.X.2



# OSPF Via L2TP[Example] – cont.

- R1 as L2TP-Server

```
[admin@R1] > /routing ospf network add network=172.16.2.0/24 area=backbone
[admin@R1] > /routing ospf network add network=172.16.3.0/24 area=backbone
[admin@R1] > /routing ospf network add network=172.16.4.0/24 area=backbone
[admin@R1] > /routing ospf network add network=192.168.1.0/24 area=backbone
[admin@R1] > /routing ospf interface print
Flags: X - disabled, I - inactive, D - dynamic, P - passive
#  INTERFACE      COST PRIORITY NETWORK-TYPE  AUTHENTICATION AUTHENTICATION-KEY
0 D <l2tp-R3>      10      1 point-to-point none
1 D ether1        10      1 broadcast    none
```

- R3

```
[admin@R3] > /routing ospf network add network=172.16.3.0/24 area=backbone
[admin@R3] > /routing ospf network add network=192.168.3.0/24 area=backbone
[admin@R3] > /routing ospf interface print
Flags: X - disabled, I - inactive, D - dynamic, P - passive
#  INTERFACE      COST PRIORITY NETWORK-TYPE  AUTHENTICATION AUTHENTICATION-KEY
0 D ether1        10      1 broadcast    none
1 D l2tp-out2     10      1 point-to-point none
```

# OSPF Via L2TP[Example] – cont.

```
[admin@R3] > ping 192.168.1.100
SEQ HOST                SIZE TTL TIME  STATUS
0 192.168.1.100         56  63 17ms
1 192.168.1.100         56  63 859ms
2 192.168.1.100         56  63 100ms
3 192.168.1.100         56  63 40ms
sent=4 received=4 packet-loss=0% min-rtt=17ms avg-rtt=254ms max-rtt=859ms
```

```
C:\Users\holys>ping 192.168.1.100

Pinging 192.168.1.100 with 32 bytes of data:
Reply from 192.168.1.100: bytes=32 time=80ms TTL=62
Reply from 192.168.1.100: bytes=32 time=34ms TTL=62
Reply from 192.168.1.100: bytes=32 time=142ms TTL=62
Reply from 192.168.1.100: bytes=32 time=29ms TTL=62

Ping statistics for 192.168.1.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 29ms, Maximum = 142ms, Average = 71ms
```



# OSPF Via L2TP[Example] – cont.

- IP Route Table

- R1

```
[admin@R1] > /ip route print
Flags: X - disabled, A - active, D - dynamic,
C - connect, S - static, r - rip, b - bgp, o - ospf, m - mme,
B - blackhole, U - unreachable, P - prohibit
#      DST-ADDRESS      PREF-SRC      GATEWAY      DISTANCE
0 A S  0.0.0.0/0          10.1.1.254    1
1 ADC  10.1.1.0/24        10.1.1.1      wlan1         0
2 ADo  172.16.3.1/32      172.16.3.2    172.16.3.2   110
3 ADC  172.16.3.2/32      172.16.3.1    <l2tp-R3>     0
4 ADC  192.168.1.0/24     192.168.1.254 ether1         0
5 ADo  192.168.3.0/24     172.16.3.2    172.16.3.2   110
```

- R3

```
[admin@R3] > /ip route print
Flags: X - disabled, A - active, D - dynamic,
C - connect, S - static, r - rip, b - bgp, o - ospf, m - mme,
B - blackhole, U - unreachable, P - prohibit
#      DST-ADDRESS      PREF-SRC      GATEWAY      DISTANCE
0 A S  0.0.0.0/0          10.1.1.254    1
1 ADC  10.1.1.0/24        10.1.1.3      wlan1         0
2 ADC  172.16.3.1/32      172.16.3.2    l2tp-out2     0
3 ADo  172.16.3.2/32      172.16.3.1    172.16.3.1   110
4 ADo  192.168.1.0/24     172.16.3.1    172.16.3.1   110
5 ADC  192.168.3.0/24     192.168.3.254 ether1         0
```

# Summary

- Untuk jaringan yang besar lebih bagus menggunakan dynamic route.
- Penggunaan L2TP lebih bagus dikarenakan L2TP lebih aman.
- OSPF dapat di jalankan melalui L2TP

**THANK YOU**