## CARA SETTING LOAD BALANCE MIKROTIK (2 MODEM DI GABUNGKAN DALAM SATU MIKROTIK ROUTER) DALAM BENTUK GUI



ALAT DAN BAHAN :

- > 2 Buah MODEM : Speddy dan AHA
- 1 Buah Router RB750
- ➢ 1 Buah Switch
- ➢ 3 Buah Komputer Client

# 1. MHD. Yuanda Hanafi Lubis

ANGGOTA KELOMPOK :

- 2. MHD. Faisal Faturrahman
- 3. MHD. Dimas Azhari

### LANGKAH KERJA

Jika anda memiliki 2 buah modem dan ingin membuatnya menjadi satu. Berikut ini adalah langkah-langkahnya :

1) Sambungkan **Kabel** pada port pertama untuk **Internet** dan untuk **Kabel** pada port kedua untuk ke **LAN Laptop (Penyetting)** 

2)	Setelah itu Klik		untuk menga	tur IP Address	
	Internet Protocol Version	n 4 (TCP/IPv4) Properties	<u>? ×</u>		
	General Alternate Config	uration			
	You can get IP settings a this capability. Otherwise for the appropriate IP se	ssigned automatically if your ne , you need to ask your network tings.	twork supports administrator		
	Obtain an IP addres	s automatically			
	Use the following IF	address:			
	IP address:				
	Sybnet mask:				
	Default gateway:				Buat saja <b>OBTAIN</b>
	Obtain DNS server	address automatically			
	C Use the following D	NS server addresses:			
	Preferred DNS server:				
	<u>A</u> lternate DNS server:	, , , , , , , , , , , , , , , , , , ,			
	🔲 Vaļidate settings u	oon exit	Advanced		
		ОК	Cancel		

3) Buka Browser, lalu ketikkan di alamat web : 192.168.88.1

### 4) Lalu Download/Klik WINBOX

Mkotk-Interface List at a x																
← → C 🗋:	192.	. 168.88	8.1/we	bfig/												☆ 🚛 =
Interfaces																WebFig v5.16
Bridge		Interfa		Ethernet Fold Tur	nel IR Tunnel G	DE Tunnel			ding LTF	n i						Interface List
Switch	μ	Incerne	ice [	Laternet Lotr ru	iner in runner d	KL Tulliel	VEAN	AKKP DOI	ang tri	•						Interface List
PPP		odd N		n in the second s												
Mesh		Muun	644 4													
IP 🕨	•	5 item	<													
MPLS .	•															
Routing 🕨	•			≜ Name	Туре	L2 MTU	тя	Rx	Tx Packet	Rx Packet	Тх	Rx	Тх	Rx		
System 🕨	•								(p/s)	(p/s)	Drops	Drops	Errors	Errors		
Queues		D	R	ether1-gateway	Ethernet	1600	0 bps	6.3 kbps	0	4	0	0	0	0		
Files	_	D	R	ether2-master-loc	Ethernet	1598	58.4 kbps	9.5 kbps	5	4	0	0	0	0		
Radius		D	S	ether3-slave-local	Ethernet	1598	0 bps	0 bps	0	0	0	0	0	0		
Tools •	•	D	s	ether4-slave-local	Ethernet	1598	0 bps	0 bps	0	0	0	0	0	0		
Log		D	S	ether5-slave-local	Ethernet	1598	0 bps	0 bps	0	0	0	0	0	0		
New Terminal																
MetaROUTER																
Make Supout.rif																
Undo																
Redo																
Hide Menu			•													
Hide Passwords																
Safe Mode																
Design Skin	Z															
Manual																
WinBox																
Graphs																
End-User License																
Logout																

### 5) Klik Start Download

🤩 Download File	Info	
URL	http://192.168.88.1/winbox/winbox.exe	
Category	Programs +	
Save As	C:\Users\Asus\Downloads\Programs\winbox.exe	
	Remember this path for "Programs" category	111,50 KB
Description		
	Download Later	

- 6) Lalu, Buka **WINBOX** yang telah di download tadi.
- 7) Lalu, Klik [...] untuk mencari MAC ADDRESS dari Mikrotik tersebut. Lalu, Klik MAC address yang terdaftar.

🔇 Mik	roTik WinBox La	ader v2.2.18			
⊆onne	ect To: D4:CA:60	9:4B:EC:CP	Cor	nnect	
	MAC Address	Address	Identity	Version	Board Name
	D4:CA:6D:4B:EC:C	D 192.168.88.1	MikroTik	5.16	RB750
<u>P</u> as:					
Addres					
•	•				l I

### 8) Lalu, Muncul Tampilan seperti Berikut. Lalu, Klik Remove Confoguration

<b>S</b>	admin@D4:CA:6D:4I	B:EC:CD (MikroTik) - WinBox v5.16 on RB750 (mipsbe)
5	😋 🛛 Safe Mode	🗹 Hide Passwords 📕 🚘
8	Safe Mode       Interfaces       Bridge       PPP       Switch       Mesh       IP       MPLS       Routing	■ Hide Passwords ■ □ RouterOS Default Configuration The following default configuration has been installed on your router: ether1 is renamed to ether1-gateway DHCP client and masquerade is set on ether1-gateway ether2 is renamed to ether2-master-local and configured as switch master port for ether3- ether5 IP address 192.168.88.1/24 and DHCP server is set on ether2-master interface DHCP servers address pool is 192.168.88.10-192.168.88.254
-OS WinBox	System  Queues Queues Files Log Radius Tools New Terminal MetaROUTER Make Supout.rif	You can click on "Show Script" to see the exact commands that are used to add and remove this default configuration. To remove this default configuration click on "Remove Configuration" or click on "OK" to continue. NOTE: If you are connected using the above IP and you remove it, you will be disconnected.  Remove Configuration Show Script OK
Router	Manual Exit	

9) Selanjutnya ditampilkan menu utama Mikrotik. Langkah awal konfigurasi adalah mengganti nama interface Mikrotik sesuai dengan yang direncanakan, yaitu sebagai berikut:

```
ether1 = modem 1
ether2 = modem 2
ether3 = lokal
```

Seperti pada gambar di bawah ini, klik menu [Interface (no.1)], lalu tab [Interface (no.2)]. Double klik pada ether1 (no.3), kemudian pada bagian Name, ganti nama ether1 menjadi modem1 (no.4), lalu [OK].

<u></u>	admin@D4:CA:6D:4	D:C1:7D (MikroTik) -	WinBox v5.16 on RB	750 (mipsbe)	-	- +	×
5	Call Safe Mode	]				✓ Hide Passwords	🔳 🛅
	Interfaces 1		Interface <ether1></ether1>				
	Bhágo		General Ethemet	Status Overall Stats	Rx Stats	ОК 5	
	PPP	interna- List	Name:	modem1 4			
	Switch	2 Interface Ethemet	Type:	Ethemet		Apply	
	Mesh	<b>Ŧ</b> ▼ <b>→</b> ×	MTU:	1500		Disable	d
		Name	L2 MTU:	1600	▲	Disable	ps 🔽
	Routing	steether2	Max L2 MTU:	4076		Comment	0
	System	R <>ether3	MAC Address:	D4:CA:6D:4D:C1:7D		Torch	0
	Queues	ether5	ARP:	enabled		Blink	0
	Files					Reset MAC Address	
	Log		Master Port:	none		Beset Counters	
$\times$	Radius		Bandwidth (Rx/Tx):	unlimited 🔻 / un	nlimited <b>Ŧ</b>		
8	Tools D		Switch:				
Vin	New Terminal						
$\geq$	MetaROUTER						
ö	Make Supout.rif	•					•
fe	Manual	5 items (1 selected)					
OU	Exit						
R			enabled	running	slave	no link	

 Selanjutnya, ganti nama ether2 menjadi modem2 dengan cara yang sama seperti langkah di atas. Double klik ether2 (no.3) kemudian pada bagian Name, ganti ether2 menjadi modem2 (no.4), lalu [OK]. Lihat langkah-langkahnya pada gambar berikut:

۲	admin@D4:CA:6D:4	D:C1:7D (MikroTik) -	WinBox v5.16 on RB	750 (mipsbe)	- +	×
5	G Sufe Mode				<ul> <li>Hide Passwords</li> </ul>	
	Interfaces 1	)	Interface <ether2></ether2>			
	Bridge		General Ethemet	Status Overall Stats Rx Stats	ок 5	
	PPP	anconacci list	Nane:	modem2 4	Canad	
	Switch	Interface Ehernet	Type:	Ethemet	Apply	
	IP Nesn		MTU:	1500	Dieable	
	MPLS D	R 3 * > ether2	L2 MTU:	1598	Comment	ps 🔽
	Routing D	R <>ether3	Max L2 MTU:	2028	Comment	0
	System N	<pre>**ether5</pre>	MAC Address:	D4:CA:6D:4D:C1:7E	Torch	0
	Queues	*>modem1	ARP:	enabled <b>T</b>	Blink	0
	Files		Master Past		Reset MAC Address	
	Log		Master Port:		Reset Counters	
X	Radius		Bandwidth (Fx/Tx):	unlimited + / unlimited +		
E E	Tools		Switch:	0		
-in	New Terminal					
	MetaROUTER					
ŏ	Make Supout.rif	•				•
ē	Manual	5 items (1 selected)				
nt o	Exit					
L N						
<b>-</b>						

11) Seperti langkah sebelumnya, kita juga akan mengganti nama ether3 menjadi lokal. Double klik ether3 (no.3), kemudian pada bagian Name, ganti nama ether3 menjadi lokal (no.4). Lihat gambar berikut:

0	admin@D4:CA:6D:4	D:C1:7D (MikroTik) -	WinBox v5.16 on RB	750 (mipsbe)	- +	×
Ю	Call Safe Mode				✓ Hide Passwords	
	Interfaces 1		Interface <ether3></ether3>			
	Brage		General Ethemet	Status Overall Stats Rx Stats	ОК 5	
	PPP		Nane:	lokal 4	Cancel	
	Switch	2 Interface Ethernet	Туре:	Ethemet	Apply	
	Mesh	+ * *	MTU:	1500	Diaphla	d
	MPLS D	Name R 3 4!>ether3	L2 MTU:	1598		ps I▼ 0
	Routing D	Alther f	Max L2 MTU:	2028	Comment	0
	System N	<pre>*i*etner5 </pre>	MAC Address:	D4:CA:6D:4D:C1:7F	Torch	0
	Queues	R <>modem2	ARP:	enabled Ŧ	Blink	0
	Files			,	Reset MAC Address	
	Log		Master Port:	none 🔹	Reset Counters	
×	Radius		Bandwidth (Rx/Tx):	unlimited		
B	Tools D		Switch:	0		
Vin	New Terminal					
$\geq$	MetaROUTER					
Ŏ	Make Supout.rif	•				•
<b>b</b>	Manual	5 items (1 selected)				
out	Exit					
Ř			enabled	running slave	link ok	

12) Setelah mengganti nama masing-masing interface, hasil konfigurasi nama interface adalah sebagai berikut:

-												
	admin@D4:CA:6D:4	D:C1:7D (M	ikroTik) - '	WinBox v5.16	5 on RB750	(mipsbe)					Ŧ	<u>^</u>
Ю	Call Safe Mode								~	Hide Pas	swords	
	Interfaces											
	Bridge											
	PPP	Interface Li	st									×
	Switch	Interface	Ethemet	EoIP Tunnel	IP Tunnel	GRE Tunnel	VLAN V	RRP Bond	ing LTE	1		
	Mesh	<b>+</b> -	× ×	: 🗖 🍸	]						Find	
	IP 🗅	Name	 e		-	L2 MTU	Tx	Rx	Tx Pac	Rx Pac	Tx Drops	
	MPLS D	<b>∜</b> ≯et	her4	Ethernet		1598	0 bps	0 bps	0	0	0	
	Routing 1		ner5	Ethernet		1598	0 bps	0 bps	0	0	0	
	Surtan N	***	kal	Ethemet		1598	50.5 kbps	1648 bps	7	2	0	
	System	R 49m	odem1 odem2	Ethemet		1598	0 bps	2 1 kbps	0	2	0	
	Queues			2			e ope	2.110000		-		
	Files											
	Log											
$\sim$	Radius											
ŝ	Tools D											
Е.	New Terminal											
$\geq$	MetaROUTER											
SO	Make Supout.rif	•										•
er(	Manual	5 items (1 s	elected)									-
H	Exit	<u>.</u>										
8												

13) Langkah selanjutnya adalah pemberian alamat IP address pada masing-masing interface yang baru saja kita ganti. Berdasarkan topologi di atas, maka IP address masing-masing interface sebagai berikut:
IP address interface modem1= 192.168.137.137 dengan IP network = 192.168.137.0 IP address interface modem2 = 192.168.25.25, dengan IP network = 192.168.25.0 IP address interface lokal = 200.200.200.1, dengan IP network = 200.200.200.0 Untuk memberikan alamat IP addres pada interface modem1, klik menu [IP (no.1)], lalu [Addresses (no.2)], kemudian klik [tanda + berwarna merah (no.3)]. Selanjutnya tampil jendela New Address, kemudian isi bagian Address = 192.168.25.237/24 (no.4), bagian Network = 192.168.25.0 (no.5), dan bagian Interface = modem1 (no.6) seperti gambar di bawah ini, kemudian [OK].

۲	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - W	inBox v5.16 on RB750 (mipsbe) - + X
	C* Safe Mode		✓ Hide Passwords 📕 🛱
	Interfaces		
	Bridge		
	PPP		
	Switch	(	
	Moek		
	IP 1 🖻	ARP	A New Address
	MPLS I	Accounting	At Kess: 192.168.137.137/24 OK 7
	Routing 1	2 Addresses	Not Series: 192.168.137.0
	System	BHCP client	Inferiore: modem 1 3 Apply
	Queues	DHCP Relay	
	Files	DHCP Server	Disable
	Log	DNS	Comment
$\times$	Radius	Firewall	Сору
8	Tools D	Hotspot	Remove
in i	New Terminal	IPsec	
1	MetaROUTER	Neighbors	
So	Make Supout.rif	Packing	
e La	Manual	Pool	U Items
E	Exit	Routes	
L R		SMB	
<b>F</b>		SNMP	

14) Hasil konfigurasi alamat IP address pada interface **modem1**.



15) Selanjutnya kita akan memberi alamat IP address pada interface modem2. Masih dari jendela Address list, klik [tanda + berwarna merah (no.1)], sehingga tampil jendela New Address, kemudian isi bagian Address = 192.168.25.25/24 (no.2), bagian Network = 192.168.25.0 (no.3), dan dan bagian Interface = modem2 (no.4) seperti gambar di bawah ini, kemudian [OK].

0	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe) - + ×
5	Cafe Mode	✓ Hide Passwords I III 💮
	Interfaces	
	Bridge	
	PPP	
	Switch	
	Mesh	
	IP D	Address Vetwork Interface V
	MPLS D	
	Routing D	New Address
	System D	24d 225 25/24 OK 5
	Queues	Ng:w 😻 192.168.25.0 🔺 Cancer
	Files	Interface: modem2
	Log	
×	Radius	Disable
B	Tools D	Comment
/in	New Terminal	Сору
1	MetaROUTER	Remove
0S	Make Supout.rif	
er.	Manual	enabled
out	Exit	
Ro		

### 16) Hasil konfigurasi alamat IP address pada interface modem2.

9	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe) - + X
5	Call Safe Mode	🗹 Hide Passwords 📕 🛅
	Interfaces	
	Bridge	
	PPP	
	Switch	
	Mesh	
	IP D	Address ↑ Network Interface ↑ 192 168 137 137/24 192 168 137.0 modem 1
	MPLS 🗅	192.168.25.25/24 192.168.25.0 modem2
	Routing D	
	System 🗅	
	Queues	
	Files	
	Log	
$\times$	Radius	
R	Tools 🗅	
/in	New Terminal	
1	MetaROUTER	
00	Make Supout.rif	2 items
e	Manual	
off	Exit	
Ř		

17) Selanjutnya kita akan memberi alamat IP address pada interface lokal. Masih dari jendela Address list, klik [tanda + berwarna merah (no.1)], sehingga tampil jendela New Address, kemudian isi bagian Address = 200.200.200.1/24 (no.2), bagian Network = 200.200.200.0 (no.3), dan Interface = lokal (no.4) seperti gambar di bawah ini, kemudian [OK].

0	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- +	×
		V Hide	Passwords	
S WinBox	Interfaces Interfaces Bridge PPP Switch Mesh IP MPLS N Routing System Queues Files Log Radius Tools New Terminal MetaROUTER Mala Saraat if	DzC1:7/D (MikroTik) - WinBox V5.16 on RB750 (mipsbe)         Image: Constraint of the second secon	Passwords	
Bro	Manual	2 items Remove		
oute	Exit	enabled		
Ř				

18) Hasil konfigurasi alamat IP address pada interface lokal.

<mark>)</mark> (	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe) - + ×
		🗹 Hide Passwords 📕 🛅
	Interfaces	
	Bridge	
	PPP	
	Switch	
	Mesh	
	IP D	Address V Network Interface
	MPLS D	⊕ 192.168.137.137/24 192.168.137.0 modem 1
	Routing D	⊕ 192.168.25.25/24 192.168.25.0 modem2
	System D	
	Queues	
	Files	
	Log	
5	Radius	
Ô	Tools D	
in	New Terminal	
$\geq$	MetaROUTER	
arOS	Make Supout.rif	
	Manual	3 items
ut	Exit	
8		

 Untuk menampilkan hasil konfigurasi pada ketiga interface di atas dapat ditampilkan dalam mode detail, yaitu dengan cara klik kanan pada salah satu IP address (no.1), lalu pilih [Detail Mode (no.2)].

0	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- + ×
			🗹 Hide Passwords 🔳 🛅
	Interfaces		
	Bridge		
	PPP		7
	Switch		
	Mesh		
	IP D	Address Network ∇ Interface ∇ ▼	
	MPLS D		
	Routing 1		-
	System D	Detail Mode	
	Queues	Klik Kanan Inline Comments	
	Files	Show Columns	
	Log	Find Ctrl+F	
X	Radius	Find Next Ctrl+G	
nBc	New Terminal	Select All Ctrl+A	
Ň	MetaROUTER	Add A	
SO	Make Supout.rif	Remove R	
uter(	Manual	3 items (1 selected) Enable E	
	Exit	Dicable D	
Ro		Comment C	

### 20) Hasil konfigurasi IP address ditampilkan dalam mode detail seperti gambar berikut:

<u></u>	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe) - + X
		✓ Hide Passwords 📕 🛅
	Interfaces	
	Bridge	
	PPP	
	Switch	
	Mesh	
	IP D	Address: 192 168 25 25/24
	MPLS D	Network: 192.168.25.0
	Routing D	Interface: modem2
	System D	Network: 192.168.137.0
	Queues	Interface: modem 1
	Files	Network: 200.200.00.0
	Log	Interface: lokal
×	Radius	
B	Tools D	
/in	New Terminal	
\$	MetaROUTER	
00	Make Supout.rif	3 itams (1 selected)
er	Manual	
out	Exit	
R		
	_	

21) Selanjutnya kita lanjutkan pengaturan IP Firewall untuk menentukan jalur-jalur yang masuk dan keluar sesuai interface yang ada. Dari tampilan menu utama mikrotik, klik [IP (no.1), lalu [Firewall (no.2).

0	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - W	nBox v5.16 on RB750 (mipsbe)	- +	x
			✓ Hide	Passwords	
	Interfaces				
	Bridge				
	PPP				
	Switch				
	Mesh				
	IP 1 🖹	ARP			
	MPLS N	Accounting			
	Routing D	Addresses			
	System D	DHCP Client			
	Queues	DHCP Relay			
	Files	DHCP Server			
	Log	DNS			
×	Radius	2 Firewall			
B	Tools	Hotspot			
/in	New Terminal	IPsec			
$\leq$	MetaROUTER	Neighbors			
00	Make Supout.rif	Packing			
e L	Manual	Pool			
ont	Exit	Routes			
N N		SMB			
		SNMP			_

22) Pada jendela Firewall yang ditampilkan, pilih tab [Mangle (no.1)], lalu klik [tanda + berwarna merah (no.2)]. Dari jendela New Mangle Rule, pilih tab [General (no.3)], kemudian isi bagian Chain = prerouting (no.4), bagian In. Interface = lokal (no.5), dan bagian Connection State = new (no.6).

S 20	admin@D4:CA:6D:4	D:C1:7D (MikroTik) -	- WinBox v5.16 on RB750 (mipsbe)		- + ×
					Hide Passwords 📔 🛅
	Interfaces				
	Bridge				
	PPP	Firewall	$\frown$		
	Switch	File: Dule: NAT	Mangle Service Ports Connections Address Lists Layer7 Protoco	ls	
	Mesh 2		Conters Counters Counters	Find	all Ŧ
	IP É				
	MPLS	New Mangle H. le			
	Routing	General Advanced	A Extra Picture Statistics		OK
	System 1	Chaite:	prerouting 4	₹	Cancel
	Queues	Src. Address:		-	Apply
	Files	Det Address:		i <b>-</b>	
	Log				Disable
	Radius	Protocol:		] -	Comment
	Tools ト	Src. Port:		1-	Сору
	New Terminal	Dst. Port:		i - 1	Remove
	MetaROUTER	Amy Port:			
	Make Supout.rif	Any. Port.			Reset Counters
	Manual	P2P:	$\square$	<b>_</b>	Reset All Counters
	Exit	In. Interface:	lokal 5	. ▲	
		Out. Interface.		-	
ŏ		Packet Mark:		. · ·	
8		Connection Mark:		-	
Ň		Routing Mark:		-	
S		Routing Table:		-	
5					
lte		Connection Type:		<b>•</b>	
- R		Connection Sate:	new 6	<b></b>	

23) Selanjutnya kita akan konfigurasi rule Nth 1,1. Nth ini bertujuan untuk menentukan apakah paket akan masuk ke group 1 atau ke group 2. Untuk 2 line, maka nanti akan di buat 2 rule dengan Nth 1,1 dan 2,1. Langkah pertama kita konfigurasi rule Nth 1,1 dahulu. Masih dari jendela New Mangle Rule, pilih tab [Extra (no.1)], kemudian klik Nth (no.2). Selanjutnya isi bagian Every = 1 (no.3), dan bagian Packet = 1 (no.4).

S 🥥	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- + ×
			Hide Passwords 📗 🛅
	Interfaces		
	Bridge		
	PPP	Firewall	
	Switch	Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols	
	Mesh	🛉 📼 🧭 🖄 🖾 🍸 🔚 Reset Counters 🛛 00 Reset All Counters 🛛 Find	all 🔻
	IP D		
	MPLS D	New Mangle Rule	
	Routing D	General Advanced Extra 1 Action Statistics	OK
	System D	Connection Limit	Cancel
	Queues	-▼- Limit	Apply
	Files		
	Log		Disable
×	Radius		Comment
B	Tools D		Сору
Vin	New Terminal	-▼- Src. Address Type	Remove
$\geq$	MetaROUTER	-▼- Dst. Address Type	
ter0	Make Supout.rif	- <b>-</b> PSD	Reset Counters
	Manual		Reset All Counters
OU.	Exit	-▼- IP Fragment	
Ř			

24) Kita mulai membuat tanda untuk jalur yang masuk (dari modem1) ke jalur lokal dengan nama Conn\_1. Selanjutnya klik tab [Action (no.1)], kemudian isi bagian Action = mark connection (no.2), bagian New Connection Mark = ketik Conn\_1 (no.3). Selanjutnya jangan lupa beri ceklist [Passthrough (no.4)], lalu [OK].

🧕 i	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- +	×
		V	Hide Passwords	
	Interfaces			
	Bridge			
	PPP	Firewall		
	Switch	Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols		
	Mesh	🛉 📼 🛷 🐹 🖾 🍸 🚝 Reset Counters 🛛 <b>00</b> Reset All Counters 🛛 Find	all	Ŧ
	IP D			
	MPLS D	New Mangle Rule		
	Routing N	General Advanced Etra 1 Action Statistics	5 OK	
	System D	Iction 2 mark connection	Cancel	
	Queues	New Connection (lark:3/Conn_1	Apply	
	Files	Pasthrough		
	Log	4	Disable	
×	Radius		Comment	
l B	Tools D		Сору	
Sir	New Terminal		Remove	
$\sim$	MetaROUTER			
Ŏ	Make Supout.rif		Reset Count	ers
Ē	Manual		Reset All Cour	nters
on	Exit			
R				

25) Hasil konfigurasi rule mangle untuk mark connection via jalur modem1:

0	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe) - + X
Г		✓ Hide Passwords 📕 🛅
	Interfaces	Firewall
	Bridge	Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols
	PPP	💠 📼 🖉 🖾 Reset Counters 🛛 00 Reset All Counters 🛛 Find 🛛 🗐
	Switch	# Action Chain Src. Address Dst. Address Proto Src. Port Dst. Port In. Inter Out. Int
	Mesh	0 and mar prerouting lokal
	IP D	
	MPLS D	
	Routing D	
	System D	
	Queues	
	Files	
×	Log	
B	Radius	
Vin	Tools D	
N SO	New Terminal	
	MetaROUTER	♦ 1 item
Ę	Make Supout.rif	
ou	Manual	
Ř	Exit	

26) Masih pada tampilan jendela Firewall, pilih tab [Mangle (no.1)], lalu klik [tanda + berwarna merah (no.2)]. Dari jendela New Mangle Rule, pilih tab [General (no.3)], kemudian isi bagian Chain = prerouting (no.4), bagian In. Interface = lokal (no.5), dan bagian Connection State = new (no.6).

0	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)		- + ×
			<b>V</b>	Hide Passwords 📗 🛅
	Interfaces	Firewall		
	Bridge	Eiter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols	3	
	PPP 2	+ - V X E Y E Reset Counters 00 Reset All Counters	Find	all Ŧ
	Switch	Action Chain Src. Address Dst. Address Proto Src. Port Dst. Por	t In	n. Inter Out. Int [ 🕶
	Mesh	0 / mar prerouting	lo	kal
	IP D	itiew mangic Rule		
	MPLS	General 3 Advanced Extra Action Statistics		ОК
	Routing N	Chain: prerouting4	Ŧ	Cancel
	System	Src. Address:	-	Apply
	Queues	Det Address:	-	
	Files			Disable
	Log	Protocol:	-	Comment
	Radius	Src. Port:	-	Сору
	Tools P	Dst. Port:	-	Remove
	New Terminal	Any Port	-	Den Constant
	MetaROUTER	pap.	_	Reset Counters
	Make Supout.m		· •	Reset All Counters
	Evit	In. Interface:	•	
	Lui	Out. Interface: ☐ lokal 5	•	
$\sim$		Packet Mark:	-	
l		Connection Made	_	
in			· •	
$\geq$		Routing Mark:	•	
Sol		Routing Table:	-	
e -		Connection Type:	-	
out				
Ř			-	

27) Selanjutnya kita akan membuat rule Nth 2,1. Masih dari jendela New Mangle Rule, pilih tab [Extra (no.1)], kemudian klik Nth (no.2). Selanjutnya isi bagian Every = 2 (no.3), dan bagian Packet = 1 (no.4).

<u>()</u>	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- + ×
			Hide Passwords 🔳 🛅
	Interfaces	Firewall	
	Bridge	Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols	
	PPP	🛉 📼 🧭 🖄 🖅 🖾 Reset Counters 🛛 00 Reset All Counters Find	all 🔻
	Switch	# Action Chain Src. Address Dst. Address Proto Src. Port Dst. Port Ir	n. Inter Out. Int I 🔻
	Mesh	0 all mar prerouting lo	kal
	IP D	New Mangle Rule	
	MPLS D	General dvanced Extra 1 Action Statistics	ОК
	Routing D	-▼- Connection Limit	Cancel
	System D	- <b>v</b> - Limit	Arabi
	Queues	- Ost. Linit	Арріу
	Files		Disable
~	Log		Comment
ĝ	Radius	Hicket 1	Сору
/in	Tools 1	<ul> <li>Time</li> <li>Tropic Address Type</li> </ul>	Remove
$\leq$	New Terminal	-▼- Dst. Address Type	
SO	MetaROUTER		Reset Counters
uter(	Make Supout.rif	-▼- Hotspot	Reset All Counters
	Manual	IP Fragment	
8	Exit		
	_		

28) Selanjutnya kita membuat tanda untuk jalur yang masuk (dari modem2) ke jalur lokal dengan nama Conn\_2. Kik tab [Action (no.1)], kemudian isi bagian Action = mark connection (no.2), bagian New Connection Mark = ketik Conn\_2 (no.3). Selanjutnya jangan lupa beri ceklist [Passthrough (no.4)], lalu [OK].

🧶 i	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- + ×
			Hide Passwords 📗 🛅
	Interfaces	Firewall	
	Bridge	Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols	
	PPP	🛉 📼 🛷 🖄 🖅 🍞 🚝 Reset Counters 🛛 00 Reset All Counters 🛛 Find	all Ŧ
	Switch	# Action Chain Src. Address Dst. Address Proto Src. Port Dst. Port Ir	n. Inter Out. Int I 🔻
	Mesh	0 / mar prerouting lo	kal 2
	IP D	New Mangle Rule	
	MPLS D	General Advanced Etra 1 Action Statistics	5 <sub>0K</sub>
	Routing D	stion <sup>2</sup> mark connection	Cancel
	System D	New Connection Mark 2 Conn 2	Arabi
	Queues		Арріу
	Files		Disable
~	Log	$\mathbf{U}$	Comment
ŝ	Radius		Сору
in	Tools D		Bemove
$\geq$	New Terminal		Tienove
SC	MetaROUTER		Reset Counters
er(	Make Supout.rif		Reset All Counters
uti	Manual		
8	Exit		

) Hasil	l konfigurasi m	ark connection via jalur modem1 d	an modem2:	
🥘 a	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mi	osbe)	- + ×
			V	Hide Passwords 📕 🖥
	Interfaces	Firewall		
	Bridge	Filter Rules NAT Mangle Service Ports Conne	ctions Address Lists Layer7 Protocols	
	PPP	🛉 🖃 🖉 🖾 🕎 🔚 Reset Cou	nters 00 Reset All Counters Find	all 🔻
	Switch	# Action Chain Src. Address Dst	Address Proto Src. Port Dst. Port	In. Inter Out. Int I 🔻
	Mesh	0 / mar prerouting		lokal
	IP D	1 / mar prerouting		lokal
	MPLS N			
	Routing 1			
	System D			
	Queues			
	Files			
$\times$	Log			
8	Radius			
lin i	Tools D			
>	New Terminal			
00	MetaROUTER	23		•
e l	Make Supout.rif			
out	Manual			
Ř	Exit			

29

30) Setelah koneksi ditandai (mark connection), kita membuat tandai jalur berikutnya (mark route) dari modem1. Masih tetap dari jendela Firewall. Pilih tab [Mangle (no.1)], lalu klik [tanda + berwarna merah (no.2)]. Dari jendela New Mangle Rule, pilih tab [General (no.3)], kemudian isi bagian Chain = prerouting (no.4), bagian In. Interface = lokal (no.5), dan bagian Connection Mark = Conn\_1 (no.6).

ة 🥝	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)		- + ×
			🖌 Hid	de Passwords 📔 🛅
	Interfaces	Firewall		
	Bridge	Etter Rulet NAT Mangle Service Ports Connections Address Lists Layer7 Protocols		
	PPP 2	+ - X E Y E Reset Counters 00 Reset All Counters	ind	all Ŧ
	Switch	Action Chain Src. Address Dst. Address Proto Src. Port Dst. Port	In.	Inter Out Int
	Mesh	0 / mar prerouting	loka	al t
	IP D	1 / mar prerouting	loka	3
	MPLS N	Hew Mangle Rule		
	Routing	General 3 Advanced Extra Action Statistics		ок
	System 🗅	Chan: prerouting	Ŧ	Cancel
	Queues	Sro Address:	-	Arabi
	Files		•	Арріу
	Log	Dst. Address:	•	Disable
	Radius	Protocol:	-	Comment
	Tools D	Src. Port:	-	Copy
	New Terminal			Permeure
$\times$	MetaROUTER	Dst. Port:	<b>T</b>	Remove
8	Make Supout.rif	Any. Port:	-	Reset Counters
/in	Manual	P2P:	-	Reset All Counters
$\leq$	Exit	In. Intenace: 🗌 lokal 5	•	
SO		Out. Interface:	-	
e				
out		Packet Mark:	•	
Ř		Connection Mark Conn_1 6	•	

31) Selanjutnya kita membuat tanda untuk jalur (*mark route*) yang masuk (dari modem1 dengan nama Route\_1. Kik tab [Action (no.1)], kemudian isi bagian Action = mark routing (no.2), bagian New Routing Mark = *ketik* Route\_1 (no.3), lalu [OK].

0	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- + ×
		_	Hide Passwords 📕 🛅
	Interfaces	Firewall	
	Bridge	Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols	
	PPP	🛉 📼 🧭 🖄 🖾 🍸 🖾 Reset Counters 🛛 00 Reset All Counters 🛛 Find	all Ŧ
	Switch	# Action Chain Src. Address Dst. Address Proto Src. Port Dst. Port Ir	ı. Inter Out. Int I 🔻
	Mesh	0 / mar prerouting lo	kal 🤅
	IP D	1 / mar prerouting	kal
	MPLS D	New Mangle Rule	
	Routing 1	General Advanced Extra Action 1 Statistics	OK 4
	System 🗅	ction2 mark routing	Cancel
	Queues	New Partice Units 1 a	Anto
	Files		Apply
	Log		Disable
	Radius		Comment
	Tools D		Copy
<b>_</b>	New Terminal		Demour
õ	MetaROUTER		Remove
i.	Make Supout.rif	L	Reset Counters
$\geq$	Manual		Reset All Counters
S	Exit		
Le Le			
Ĥ			
8			
	_		

(2) (0) a	Hasii Koniigun admin@D4:CA:6D:4	D:C1:7D (MikroTik)	- WinBox	alur x v5.10	5 on RB75	) (mipsbe)	8						+	×
											✓	Hide Pas	sswords	- 🗎
	Interfaces	Firewall											[	
	Bridge	Filter Rules NAT	Mangle	Servi	ce Ports (	Connections	Ad	ldress Lis	sts Layer	7 Protoco	ols			
	PPP		3 🖻		E Rese	t Counters	00	Reset	All Counter	rs	Find	а	ill	Ŧ
	Switch	# Action	Chain		Sinc Address	Dst Addres	88	Proto	Src. Port	Dst P	ort	In Inter	Out Int	
	Mesh	0 2 mar	preroutin	g					010.101	000.1		okal	000	(
	IP D	1 2 mar	preroutin	g								okal		1
	MPLS N	2 2 mar	preroutin	g								okal		
	Routing 1													
	System N													
	Queues													
	Files													
	Log													
	Radius													
	Tools D													
	New Terminal													
õ	MetaROUTER	•												•
nB	Make Supout.rif	3 items					_							
Wi	Manual													
Ś	Exit													
5														
Ę														
ğ														
ш														

33) Selanjutnya membuat tandai jalur berikutnya (*mark route*) dari modem2. Masih tetap dari jendela Firewall. Pilih tab [Mangle (no.1)], lalu klik [tanda + berwarna merah (no.2)]. Dari jendela New Mangle Rule, pilih tab [General (no.3)], kemudian isi bagian Chain = prerouting (no.4), bagian In. Interface = lokal (no.5), dan bagian Connection Mark = Conn\_2 (no.6).

🧶 i	admin@D4:CA:6D:4	ID:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- + ×
		_	🗹 Hide Passwords 📗 👩
	Interfaces	Firewall	
	Bridge	Filter Rules WAT 1 Mangle Service Ports Connections Address Lists Layer7 Protocols	s
	PPP	2 🕂 🚽 🔗 🖄 🖆 🍸 🚝 Reset Counters 🛛 oo Reset All Counters 🛛 🕞	Find all 🔻
	Switch	# Action Chain Src. Address Dst. Address Proto Src. Port Dst. Port	rt In. Inter Out. Int I▼
	Mesh	0 / mar prerouting	lokal
	IP D	1 / mar prerouting	lokal
	MPLS 🗅	New Manala Dula	
	Routing		
	System	Sceneral Advanced Extra Action Statistics	ОК
	Queues	Chan: prerouting 4	Cancel
	Files	Src. Address:	<ul> <li>Apply</li> </ul>
	Log	Dst. Address:	▼ Disable
	Radius		
	Tools D	Protocol:	
	New Terminal	Src. Port:	- Сору
	MetaROUTER	Dst. Port:	- Remove
ŏ	Make Supout.rif	Any. Port:	Reset Counters
nB	Manual	P2P:	<ul> <li>Reset All Counters</li> </ul>
$\geq$	Exit	In. Interface: Iokal 5	▲
S			-
L'a			·
ute		Packet Mark:	•
Ro		Connection Mart Conn 2 6	•

34) Selanjutnya kita membuat tanda untuk jalur (*mark route*) yang masuk (dari modem2) dengan nama Route\_2. Kik tab [Action (no.1)], kemudian isi bagian Action = mark routing (no.2), bagian New Routing Mark = *ketik* Route\_2 (no.3), lalu [OK].

S 🕗	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- + ×
		_	Hide Passwords 📗 🛅
	Interfaces	Firewall	
	Bridge	Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols	
	PPP	🛉 📼 🖉 🖾 🕎 🖾 Reset Counters 🛛 oo Reset All Counters 🛛 Find	all Ŧ
	Switch	# Action Chain Src. Address Dst. Address Proto Src. Port Dst. Port I	n. Inter Out. Int I 🔻
	Mesh	0 / mar prerouting	okal 8
	IP D	2 2 mar prerouting	okal 4
	MPLS D	New Mangle Rule	
	Routing N	General Advanced Ette Action Statistics	
	System D		
	Queues	Action:2 mark rut	Cancel
	Files	New Routing Mark: Route 2 3	Apply
X	Log	Passtheegn	Disable
ĕ	Radius		Commont
1.	Tools 1		Commeric
S	New Terminal		Сору
2	MetaROUTER		Remove
ute	Make Supout.rif		Reset Counters
<sup>8</sup>	Exit		Reset All Counters

35) Hasil konfigurasi *mark routing* dan *mark connection* dari Mangle yang kita buat untuk tanda koneksi via jalur modem1 dan modem2:

🌔 i	admin@D4:CA:6D:	4D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe) - + >	×
		✓ Hide Passwords	
	Interfaces	Firewall	×
	Bridge	Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols	
	PPP	🛉 📼 🧹 💥 🖾 🍸 🚝 Reset Counters 🛛 <b>oo</b> Reset All Counters 🛛 Find 🛛 all	Ŧ
	Switch	# Action Chain Src. Address Dst. Address Proto Src. Port Dst. Port In. Inter Out. Int	-
	Mesh	0 🖉 mar prerouting lokal	\$
	IP D	1 / mar prerouting lokal	-4
	MPLS N	2 2 mar prerouting lokal	
	Routing N		
	System P		
	Queues		
	Files		
×	Log		
B	Radius		
/in	Tools D		
eros M	New Terminal		
	MetaROUTER		
	Make Supout.rif	4 frems	
out	Manual		
R	Exit		

36) Langkah berikutnya adalah membuat Network Address Translation (NAT) untuk mengarahkan jalur-jalur (*mark connection* dan *mark routing*) yang telah kita tandai sebelumnya melalui modem1. Masih dari jendela Firewall, pilih tab [NAT (no.1)], lalu klik [tanda + berwarna merah (no.2)] sehingga ditampilkan jendela New NAT Rule. Klik tab [General (no.3)], kemudian isi bagian Chain = srcnat (no.4), bagian Out. Interface = modem1 (no.5), dan bagian Connection Mark = Conn\_1 (no.6).

<u></u>	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- + ×
	·		Hide Passwords 📗 🛅
	Interfaces	Frewall	
	Bridge	Filter Rives 1 NAT Mangle Service Ports Connections Address Lists Layer7 Protocols	
	PPP	2+ - 🖉 🖄 🖆 🍸 🚝 Reset Counters 00 Reset All Counters Fil	nd all 🔻
	Switch		
	Mesh	3 General Advanced Extra Action Statistics	OK
	IP N		
	MPLS D	Citain: srcnat 4	Cancel
	Routing D	Src. Address:	Apply
	System 🗅	Dst. Address:	Disable
	Queues		
	Files	Protocol:	Comment
	Log	Src. Port:	Сору
ŏ	Radius	Dst. Port:	Remove
ШЩ	Tools D	Any. Port:	Reset Counters
$\geq$	New Terminal	In Interface:	
S	MetaROUTER		Reset All Counters
er O	Make Supout.rif		
ute	Manual	Packet Mark:	
Ro	Exit	Connection Mark Conn 6	

37) Selanjutnya klik tab [Action (no.1), lalu pada pilih bagian Action = masquerade (no.2), kemudian [OK].

0	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- + X
		_	Hide Passwords 📕 🛅
	Interfaces	Firewall	
	Bridge	Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols	
	PPP	🛉 📼 🖉 🖾 🕎 🖾 Reset Counters 🛛 <b>oo</b> Reset All Counters 🛛 Fin	d all Ŧ
	Switch	New NAT Rule	
	Mesh	General Advanced Adra 1Action Statistics	3 OK
	IP D		
	MPLS D	Acton: Zmasquerade	Cancel
	Routing 1		Apply
	System N		Disable
	Queues		Comment
	Files		Comment
	Log		Сору
ĝ	Radius		Remove
in	Tools D		Reset Counters
≥	New Terminal		Reset All Counters
SO	MetaROUTER		Heset Air Counters
er(	Make Supout.rif		
ute	Manual		
Ro	Exit		
	_		

38) Hasilnya konfigurasi NAT untuk jalur modem1:

🧶 i	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- +	x
			lide Passwords	
	Interfaces	Firewall		
	Bridge	Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols		
	PPP	+ - V X A Factor Counters 00 Reset All Counters	/ all	₹
	Switch	# Action Chain Src. Address Dst. Address Proto Src. Port Dst. Port In	Inter Out. Int.	
	Mesh	0 #Il mas srcnat	modem1	
	IP 🗅			
	MPLS 🗅			
	Routing 1			
	System 🗈			
	Queues			
	Files			
	Log			
ŏ	Radius			
BE	Tools D			
Ň	New Terminal			
S	MetaROUTER	1 tom		•
5	Make Supout.rif			
ute	Manual			
Sol 1	Exit			
- E				

39) Selanjutnya konfigurasi Network Address Translation (NAT) untuk modem2. Masih dari jendela Firewall, pilih tab [NAT (no.1)], lalu klik [tanda + berwarna merah (no.2)] sehingga ditampilkan jendela New NAT Rule. Klik tab [General (no.3)], kemudian isi bagian Chain = srcnat (no.4), bagian Out. Interface = modem2 (no.5), dan bagian Connection Mark = Conn\_2 (no.6).

0	admin@D4:CA:6D:4	ID:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- +	×
			✓ Hide Passwords	s 🔳 🔒
	Interfaces	Frewall		
	Bridge	Filter Rules 1NAT Mangle Service Ports Connections Address Lists Layer7 Protocols	(	
	PPP	2 🕂 🖓 🖉 📳 🍸 🔚 Reset Counters 🛛 00 Reset All Counters	Find all	∓
	Switch	# Action Chain Src. Address Dst. Address Proto Src. Port Dst. Port	In. Inter Out. Ir	nt ( 🔻
	Mesh	0 ≓ll mas srcnat	moder	m1
	IP D	New NAT Rule		
	MPLS	3General Advanced Extra Action Statistics	ОК	
	Routing	Clain: srcnat 4	Cance	1
	System	Src. Address:	- Apply	
	Queues			
	Files	Ust. Address:	Disable	e
	Log	Protocol:	Comme	nt
	Radius	Src. Port:	- Сору	
×	Tools D	Det Port	Bemov	re l
8	New Terminal			
/in	MetaROUTER	Any. Port:	Reset Cou	nters
2	Make Supout.rif	In. Interface:	Reset All Co	unters
, O	Manual	Out. Interface modem2 5	•	
Ę	Exit			
oul				
Ř		Connection Mart	•	

40) Selanjutnya klik tab [Action (no.1), lalu pada pilih bagian Action = masquerade (no.2), kemudian [OK].

0	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- + ×
	·	_	Hide Passwords 📕 <u>न</u>
	Interfaces	Firewall	
	Bridge	Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols	
	PPP	🛉 📼 🔗 🖾 🍸 🖾 Reset Counters 🛛 <b>00</b> Reset All Counters 🛛 <i>Fir</i>	nd all Ŧ
	Switch	# Action Chain Src. Address Dst. Address Proto Src. Port Dst. Port	n, Inter Out, Int I 🔻
	Mesh	0 ≓ll mas srcnat	modem1
	IP 🗅	New NAT Rule	
	MPLS D	General Advanced Etra 1 Action Statistics	3 ок
	Routing D	Action: masquerade	Cancel
	System 🗅		
	Queues		Apply
	Files		Disable
X	Log		Comment
ĕ	Radius		Copy
-	Tools D		Demour
ros V	New Terminal		Kemove
	MetaROUTER		Reset Counters
E	Make Supout.rif		Reset All Counters
0	Manual		
2	Exit		

<u>()</u> a	admin@D4:CA:6D:4	ID:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe) - + >	×
	. <u> </u>	✓ Hide Passwords	
	Interfaces	Firewall	
	Bridge	Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols	
	PPP	🛉 🖃 🖉 🖾 🧊 🚝 Reset Counters 00 Reset All Counters Find all	Ŧ
	Switch	# Action Chain Src. Address Dst. Address Proto Src. Port Dst. Port In. Inter Out. Int	
	Mesh	0 ≠II mas srcnat modem1	
	IP D	1 ≓∥ mas srcnat modem2	
	MPLS N		
	Routing D		
	System D		
	Queues		
	Files		
×	Log		
B	Radius		
Vin	Tools D		
$\geq$	New Terminal		
Ŏ	MetaROUTER	2 items	
ē	Make Supout.rif		
out	Manual		
Ř	Exit		

41) Hasilnya konfigurasi NAT untuk jalur modem1 dan modem2:

42) Langkah terakhir menentukan alamat utama jalur-jalur modem yang kita punya dari menu [IP] (no.1), lalu pilih [Routes (no.2)].

0	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - W	nBox v5.16 on RB750 (mipsbe)		×
				✓ Hide Passwords	
	Interfaces				
	Bridge				
	PPP				
	Switch				
	Mode				
	1 IP 🔶 🖹	ARP			
	MPLS N	Accounting			
	Routing	2 Addresses			
	System	DHCP Client			
	Queues	DHCP Relay			
	Files	DHCP Server			
	Log	DNS			
	Radius	Firewall			
×	Tools D	Hotspot			
R	New Terminal	IPsec			
/in	MetaROUTER	Neighbors			
	Make Supout.rif	Packing			
Ö	Manual	Pool			
Ę	Exit	Routes			
no		SMB			
Ř		SNMP			
		Cardiana			

43) Pertama kita membuat IP route dari modem1. Pilih tab [Routes (no.1)], kemudian klik [tanda + berwarna merah (no.2)]. Selanjutnya isi pada bagian Dst. Address = 0.0.0.0/0, bagian Gateway = 192.168.137.1 (merupakan IP Gateway pada modem1), bagian Type = unicast (no.6), Distance = 1, Scope = 255, Target Scope = 10, Routing Mark = Route\_1, kemudian klik [OK].

<b>S</b>	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- +	×
Ю	Ca Safe Mode	✓ Hide Pa	asswords	
	Interfaces			
	Bridge	Rolltes Nexthops Rules VRF		
	PPP			
	Switch	Det:Address / Gateway Distance Rout		
	Mesh	DAC ▶ 192.168.25.0/ modem1 unreachable 0		
	IP D	DAC ▶ 192.168.137.0 modem1 unreachable 0		
	MPLS D	DAC   ▶ 200.200.0   modem1 unreachable 0	[	
	Routing	General Attubute	11 OK	
	System			
	Queues	Dist. Address.	Cano	el
	Files	Gateway: 192.168.137.1	Apply	/
X	Log	Check Gateway.	Disab	le
B	Radius		Comme	ent
Vir	Tools 🗅			=
>	New Terminal	Distance <sup>7</sup> 1	Сору	<u></u>
Ŏ	MetaROUTER	Scotle: 255 8	Remo	ve
ter	Make Supout.rif	Target cope 9 10		
DU D	Manual			
Å	Exit	Routing Mark: [Route_1]		

44) Hasilnya konfigurasi IP Route untuk IP Gateway dari modem1:

<b>()</b>	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)			+ ×
Ю	C <sup>4</sup> Safe Mode			✓ Hide Passwor	ds 📕 🛅
	Interfaces				
	Bridge				
	PPP	Route List			×
	Switch	Routes Nexthops Rules VRF			
	Mesh	+ - / × - 7	Find	all	F
	IP D	Dst. Address 🗸 Gateway	Distance	Routing Mark	-
	MPLS D	AS > 0.0.0.0/0 192.168.137.1 reachable modem1	1	Route_1	
	Routing 1	DAC  192.168.25.0/ modem2 reachable DAC  192.169.127.0 modem1 reachable	0	1	92
	System D	DAC ► 132.168.137.0 Indeen Teachable	0	2	00
	Queues				
	Files				
	Log				
	Radius				
X	Tools D				
цĞ	New Terminal				
-	MetaROUTER				
S	Make Supout.rif				
6	Manual	ditems (1 selected)			•
te	Exit				
0					
R					

45) Selanjutnya kita membuat IP route dari modem2. Pilih tab [Routes (no.1)], kemudian klik [tanda + berwarna merah (no.2)]. Selanjutnya isi pada bagian Dst. Address = 0.0.0.0/0, bagian Gateway = 192.168.25.254 (merupakan IP Gateway pada modem2), bagian Type = unicast (no.6), Distance = 1, Scope = 255, Target Scope = 10, Routing Mark = Route\_2, kemudian klik [OK].



### 46) Hasilnya konfigurasi IP route dari modem1 dan modem2:

Safe Mode		✓ Hide Passwords
Interfaces		
Bridge		
PPP	Route List	
Switch	Routes Nexthops Rules VRF	
Mesh	+ × × - 7	Find all <b>F</b>
IP 🗅	Dst. Address 🖌 Gateway	Distance Routing Mark 💌
MPLS D	AS 0.0.0.0/0 192.168.137.1 reachable modem1	1 Route_1
Bouting N	AS > 0.0.0.0/0 192.168.25.254 reachable modem2	1 Route_2
	DAC > 192.168.25.0/ modem2 reachable	0 192
System P	DAC P 192.168.137.0 modem1 reachable	0 192
Queues	DAC P 200.200.200.0 lokal reachable	0 200
Files		
Log		
Radius		
Tools 🗅		
New Terminal		
MetaROUTER		
Make Supout.rif		
Manual	• 5 items (1 selected)	<b>→</b>
Exit		
-		

47) Tinggal satu bagian lagi, yaitu konfigurasi untuk menentukan jalur route yang diutamakan. Dalam hal ini, route yang diutamakan adalah jalur dari **modem1**. Maka cara konfigurasinya cukup dengan menambah konfigurasi IP route dari modem1, seperti pada langkah konfigurasi IP route dari modem1, namun bagian Routing Mark-nya tidak ditandai. Untuk itu, pilih tab [**Routes** (no.1)], kemudian klik [tanda + berwarna **merah** (no.2)]. Selanjutnya isi pada bagian **Dst. Address = 0.0.0.0/0**, bagian **Gateway = 192.168.137.1**(merupakan IP Gateway pada modem1), bagian **Type = unicast** (no.6), **Distance = 1**, **Scope = 255**, **Target Scope = 10**, kemudian klik [**OK**].

admin@D4:CA:6D:4D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)	- +	×
Safe Mode	✓ Hide Passwords	
Interfaces		1
Bridge IRoutes Nexthops Rules VRF		
PPP 2 +	Find all <b></b>	
Switch Dst. Address / Gateway	Distance Routing Mark	
Mesh S > 0.0.0.0/0 192.168.137.1 unreachable	1 Route_1	
IP ► S ► 0.0.0.0/0 192.168.25.254 unreachable	1 Route_2	
MPLS DAC P 192.168.25.0/ modem1 unreachable	0 19	
Routing	0 20	
System N		
Queues Route		
Files 3 ieneral Attributes		0 0
Log Dst. Address: 0.0.0.0/04		Can
Radius		
Tools		App
New Terminal Check Gateway:	•	Disa
MetaROUTER Type: unicast 6	Ŧ	Comr
Make Supout.rif		6
	▲	Co
Manual Distance 7 1		
Manual     Distance 7 1       Exit     Scole: 255 8		Rem

48) Hasilnya konfigurasi IP route untuk loadbalance dengan modem1 sebagai jalur line yang diutamakan:

0	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe)		-	+ ×
5	C* Safe Mode			✓ Hide Passv	vords 📕 🛅
	Interfaces				
	Bridge				
	PPP	Route List		[	
	Switch	Routes Nexthops Rules VRF			
	Mesh	+ × = 7	Find	all	Ŧ
	IP D	Dst. Address 🗸 Gateway	Distance	Routing Mark	· ·
	MPLS D	AS 0.0.0.0/0 192.168.137.1 reachable modem1	1	Route_1	
	Routing D	AS 0.0.0.0/0 192.168.25.254 reachable modem2	1	Route_2	
	Sustan N	AS P 0.0.0.0/0 192.168.137.1 reachable modem 1			102
	System	DAC   192.168.137.0 modem1 reachable	0		192
	Queues	DAC 200.200.0 lokal reachable	0		200
	Files				
	Log				
	Radius				
	Tools D				
ŏ	New Terminal				
nB	MetaROUTER				
Ň	Make Supout.rif				
S	Manual	6 items (1 selected)			
5	Exit				
te l					
D					
Res 1					

49) Untuk pembatasan bandwidh bisa dilakukan dari menu [Queues (no.1)] → tab [simple queue no.2)], lalu klik [tanda + berwarna merah (no.3)]. Kemudian pilih tab [General], lalu isi dibagian Name = KELOMPOK FAISAL\_YUANDA, Target Address = 200.200.200.0/24, Max Limit Target Upload = 64k, Max Limit Target download = 64k, lalu [OK]. Lihat seperti gambar berikut ini:

### 50) Maka hasil pembatasan bandwidth dari Queues seperti gambar berikut:

<mark>)</mark> (	admin@D4:CA:6D:4[	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe) - + ×
5	Call Safe Mode	🗹 Hide Passwords 📕 🔂
	Interfaces Bridge	Queue List
	PPP Switch	<ul> <li></li></ul>
	Mesh IP D	Indiget Au     Fix Max Limit     Fix Max Limit       0          B KELOMPOK FAISAL_YUANDA          200.200.2          64k
	MPLS Nouting	
	System D	
	Files	
Box	Log Radius	
Win	Tools	
ros	MetaROUTER	1 item (1 selected) 0.8 gueued 0.0 packets gueued
outel	Make Supout.rif Manual	
R S	Exit	

C:\Windows\system32\cmd.exe - +	×
C:\Users\Yuanda>ping 192.168.25.254	*
Pinging 192.168.25.254 with 32 bytes of data: Reply from 192.168.25.254: bytes=32 time<1ms TTL=63 Reply from 192.168.25.254: bytes=32 time<1ms TTL=63 Reply from 192.168.25.254: bytes=32 time<1ms TTL=63 Reply from 192.168.25.254: bytes=32 time<1ms TTL=63	ľ
Ping statistics for 192.168.25.254: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = Oms, Maximum = Oms, Average = Oms	
C:\Users\Yuanda>	~
Image: A second seco	- F

<u>()</u> a	idmin@D4:CA:6	5D:4	D:C1:7D (MikroTil	:) - WinB	ox v5.1	.6 on R	B750 (ı	mipsbe	)					• +	>	٢
													lide Pas	swords		<u> </u>
	Interfaces		Teminal													×
	Bridge		MMM MM	M III	KKK	KKK	RRR	RRR	0000	000	Т	TT	III	KKK	K	٠
	PPP		MikroTik Ro	uter05	5.16	(c) 1	999-2	012	1	http:	//www	.mikr	otik.d	com/		
	Switch															
	Mesh															
	IP	Þ														
	MPLS	Þ	[admin@MikroT	ikl > r	oing 1	192.16	8.25.	254								
	Routing	Þ	HOST						SIZE	TTL	TIME	STAT	JS			
	System	Þ	192.168.25.25	4 4					56	64 64	Oms Oms					
	Queues		192.168.25.254 56 64 0ms													
	Files		sent=3 re	ceived=	=3 pac	:ket-1	oss=0	% min	-rtt=(	Oms a	vg-rt	t=Oms	max-1	ctt=Om	s	
×	Log		[admin@MikroT	ik] > p	oing 1	192.16	8.25.	254								
B	Radius		HOST						SIZE	TTL	TIME	STAT	JS			
/in	Tools	Þ	192.168.25.25	4					56	64	Oms					
5	New Terminal		192.168.25.25	4					56	64	Oms					
00	MetaROUTER		192.168.25.25	4 4					56	64 64	oms Oms					
er L	Make Supout.rif		sent=5 re	ceived=	=5 pac	ket-1	oss=0	% min	-rtt=(	Oms a	vg-rt	t=Oms				
out	Manual		max-rtt=1m	3												
R	Exit		[admin@MikroT	ik] >												٠

# C:\Windows\system32\cmd.exe - + X C:\Users\Yuanda>ping 192.168.137.1 Pinging 192.168.137.1 with 32 bytes of data: Reply from 192.168.137.1: bytes=32 time=492ms TTL=127 Reply from 192.168.137.1: bytes=32 time=1061ms TTL=127 Reply from 192.168.137.1: bytes=32 time=5ms TTL=127 Ping statistics for 192.168.137.1: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 0ms, Maximum = 1061ms, Average = 389ms C:\Users\Yuanda>\_

<u></u>	admin@D4:CA:6D:4	D:C1:7D (MikroTik) - WinBox v5.16 on RB750 (mipsbe) - + ×
5	C* Safe Mode	V Hide Passwords
	Interfaces	Route List
	Bridge	Teminal
	PPP	MMM MMM KKK TITITITITI KKK •
	Switch	MMM MMMM MMM III KKK KKK RRRRR 000000 TTT III KKK KKK
	Mesh	MMM MM MMM III KKKKK RRR RRR 000 000 TTT III KKKKK
	IP D	MMM MMM III KKK KKK RRR RRR 000000 TTT III KKK KKK
	MPLS D	
	Routing 1	Mikrolik Routeros 5.16 (c) 1999-2012 http://www.mikrotik.com/
	System D	
	Queues	
	Files	
	Log	[admin@MikroTik] > ping 192.168.137.1
	Radius	192.168.137.1 56 128 19ms
X	T duius	192.168.137.1 56 128 15ms
L M	Tools D	192.168.137.1 56 128 19ms
2	New Terminal	192.168.137.1 56 128 8ms
$\geq$	MetaBOUTER	192.168.137.1 56 128 6ms
Ś	Make Supout rif	sent=6 received=6 packet-loss=0% min-rtt=1ms avg-rtt=11ms max-rtt=19ms
5	Manual	
Ite	Evit	
ō		
E.		

===TERIMA KASIH===