



Load Balancing using PCC connected via PPPoE (with Port Forwarding)

MUM South Africa, July 2013

- » **David Bisschoff**
- » **Durban, South Africa**
- » **Work at Kinsey Computers**
- » **Discovered MikroTik in 2011**

About Me



» Steve Discher

- > MUM - USA Sep 2012
- > RouterOS by Example

» Greg Sowell

- > <http://gregsowell.com>

» Syed Jahanzaib

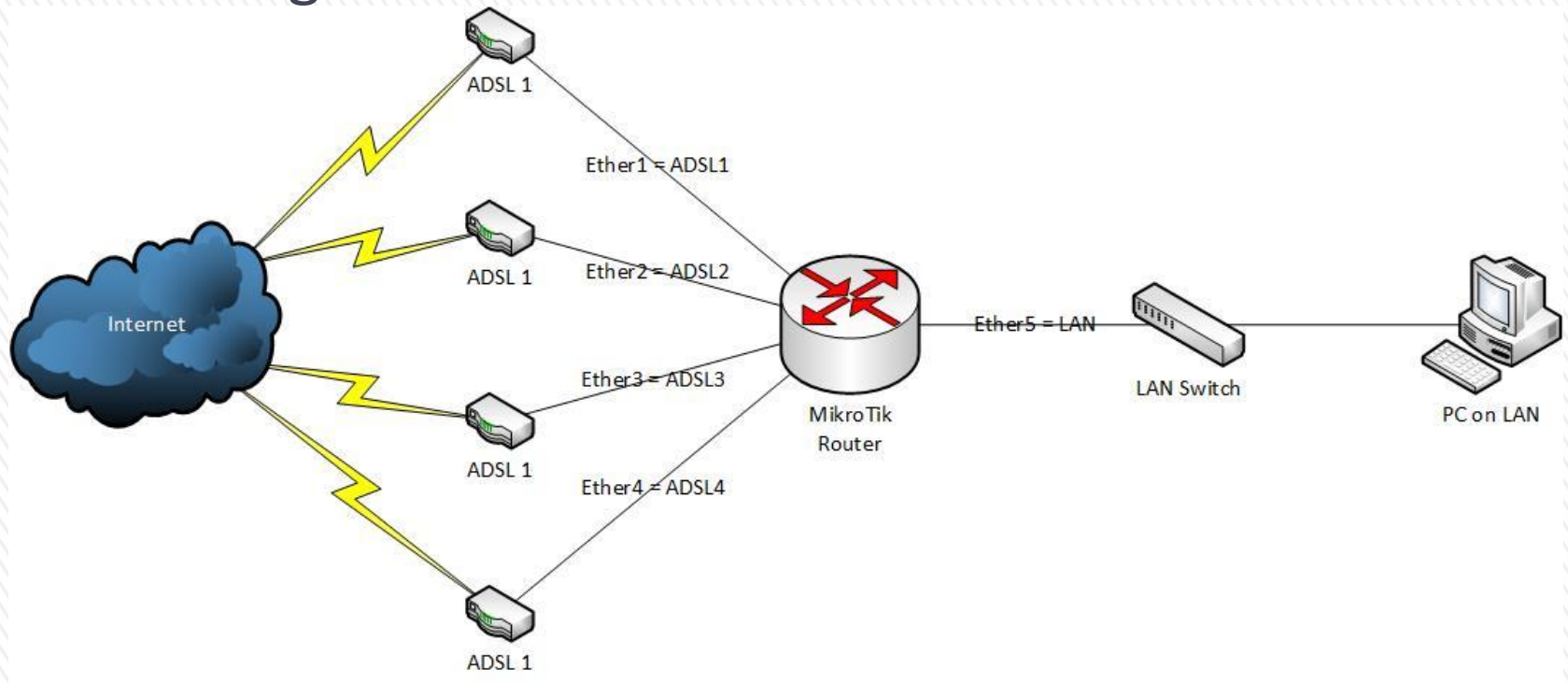
- > <http://aacable.wordpress.com/category/mikrotik-related/>

» YouTube / Google

Borrowed Knowledge

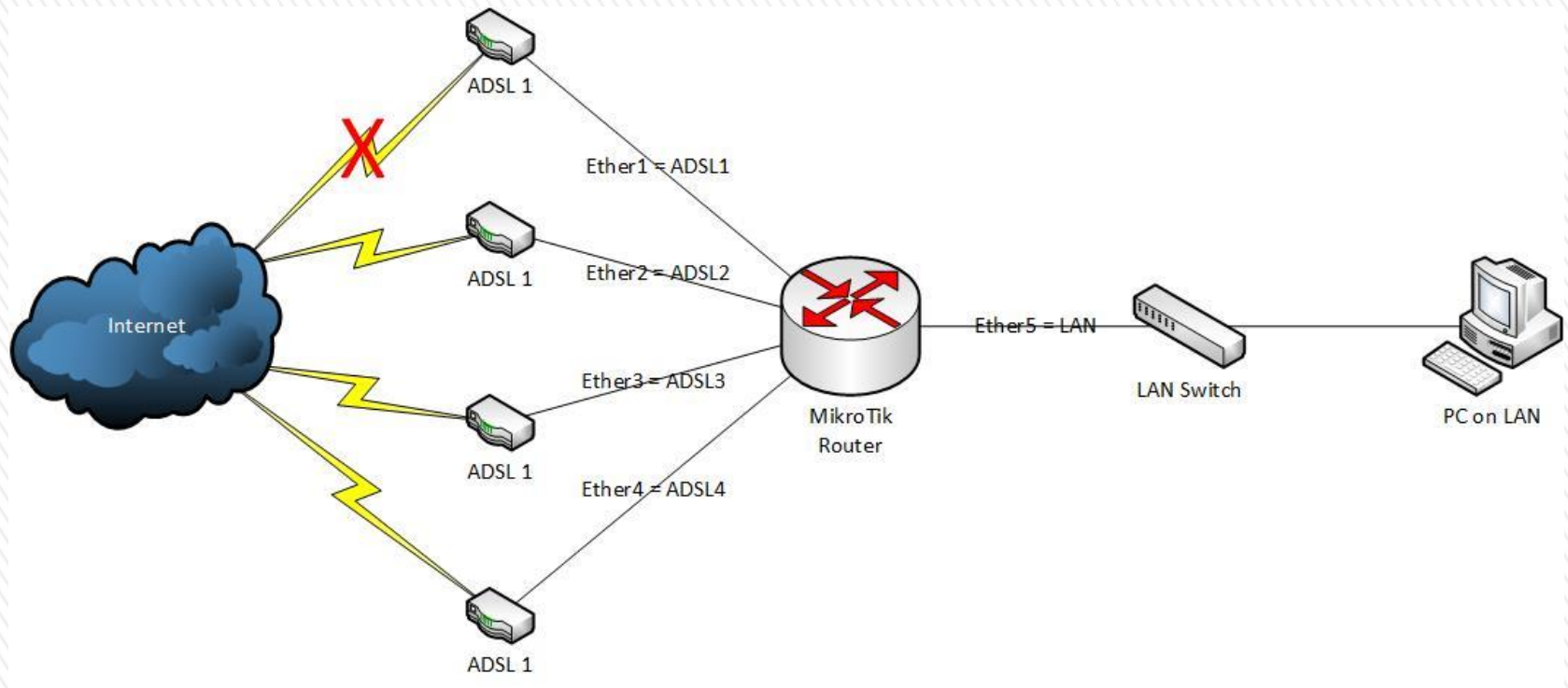


» Load Balancing is methodology with aim to spread traffic across multiple links to get better links usage.



Load balancing?

» When Telkom Line goes down – how to failover?



Why use PPPoE?



Interface List						
Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel ...						
<div> <div>+</div> <div>-</div> <div>✓</div> <div>✗</div> <div>📁</div> <div>🔍</div> <div>Find</div> </div>						
Name	Type	L2 MTU	Tx	Rx		
ADSL1	Ethernet	1520	0 bps	0 bps		
ADSL2	Ethernet	1520	0 bps	0 bps		
ADSL3	Ethernet	1520	0 bps	0 bps		
ADSL4	Ethernet	1520	0 bps	0 bps		
R LAN	Ethernet	1520	61.9 kbps	14.5 kbps		

Interface List					
Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel ...					
<div> <div>+</div> <div>-</div> <div>✓</div> <div>✗</div> <div>📁</div> <div>🔍</div> <div>Find</div> </div>					
Name	Type	L2 MTU	Tx	Rx	
ADSL ISP					
pppoe-1	PPPoE Client		0 bps	0 bps	
ADSL ISP					
pppoe-2	PPPoE Client		0 bps	0 bps	
ADSL ISP					
pppoe-3	PPPoE Client		0 bps	0 bps	
ADSL ISP					
pppoe-4	PPPoE Client		0 bps	0 bps	

Interface <pppoe-2>

General Dial Out Status Traffic

Service:

AC Name:

User:

Password:

Profile:

Keepalive Timeout:

☐ Dial On Demand
☐ Add Default Route
☐ Use Peer DNS

- Allow -
☒ pap ☒ chap
☒ mschap1 ☒ mschap2

enabled running slave Status: disconnected

Interface <pppoe-1>

General Dial Out Status Traffic

Name:

Type:

L2 MTU:

Max MTU:

Max MRU:

MRRU:

Interfaces:

enabled running slave Status: disconnected

Basic setup – Interface Names / PPPoE Interfaces

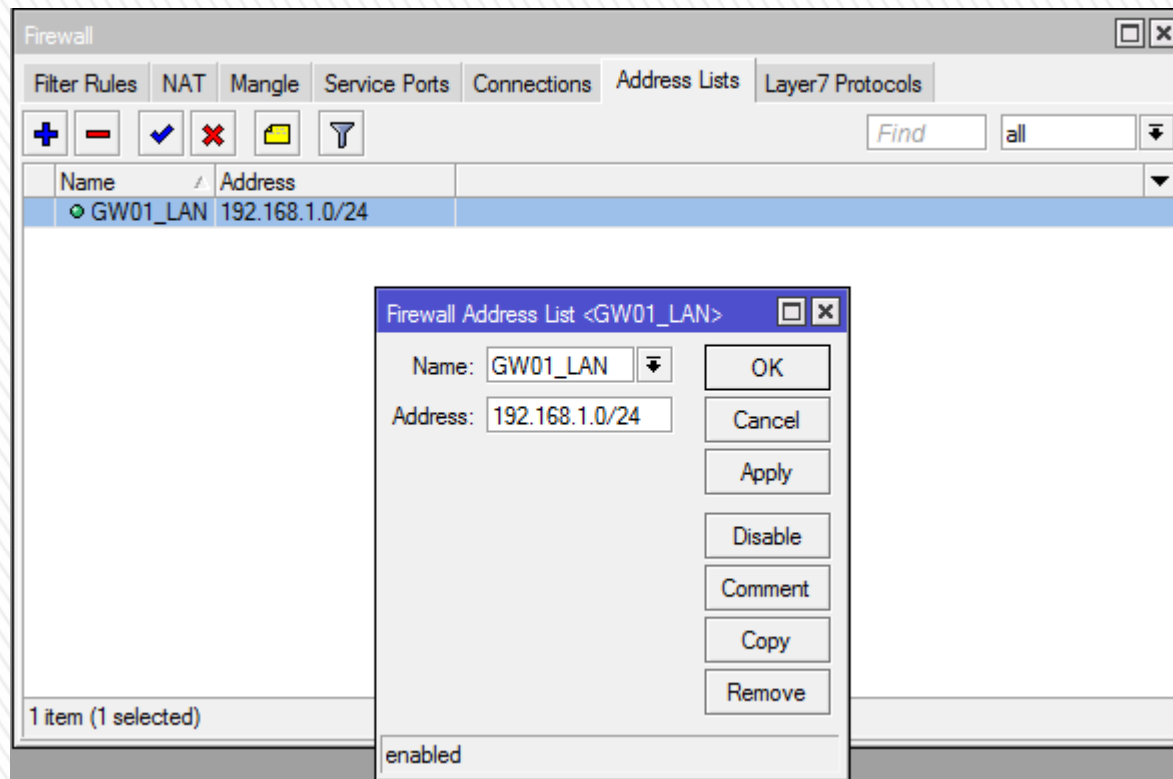
The screenshot displays three overlapping windows from the Mikrotik WinBox interface:

- Firewall Window:** Shows the NAT tab with a table of masquerade rules.

#	Action	Chain	In. Inter...	Out. Inter...	Bytes	Packets
0	masquerade	srcnat		pppoe-1	0 B	0
1	masquerade	srcnat		pppoe-2	0 B	0
2	masquerade	srcnat		pppoe-3	0 B	0
3	masquerade	srcnat		pppoe-4	0 B	0
- Address List Window:** Shows a list of address ranges assigned to various interfaces.

Address	Network	Interface
LAN		
192.168.1.1/24	192.168.1.0	LAN
ADSL_ROUTER_1		
192.168.5.254/24	192.168.5.0	ADSL1
ADSL_ROUTER_2		
192.168.6.254/24	192.168.6.0	ADSL2
ADSL_ROUTER_3		
192.168.7.254/24	192.168.7.0	ADSL3
ADSL_ROUTER_4		
192.168.8.254/24	192.168.8.0	ADSL4
- DNS Settings Window:** Shows configuration for DNS servers.
 - Servers: 8.8.8.8, 8.8.4.4
 - Dynamic Servers: (empty)
 - ☒ Allow Remote Requests
 - Max UDP Packet Size: 4096
 - Cache Size: 2048 KB
 - Cache Used: 9
- Address Detail Window:** A pop-up for the selected address 192.168.5.254/24.
 - Address: 192.168.5.254/24
 - Network: 192.168.5.0
 - Interface: ADSL1
 - Status: enabled

Basic setup – NAT / IP Addresses / DNS ➤



/ip firewall address-list

add address=192.168.1.0/24 disabled=no list=GW01_LAN

Firewall Address List



Mangle Rule <>

General Advanced Extra Action Statistics

Chain: prerouting

Src. Address:

Dst. Address:

Protocol:

Src. Port:

Dst. Port:

Any. Port:

P2P:

In Interface:

OK

Cancel

Apply

Disable

Comment

Copy

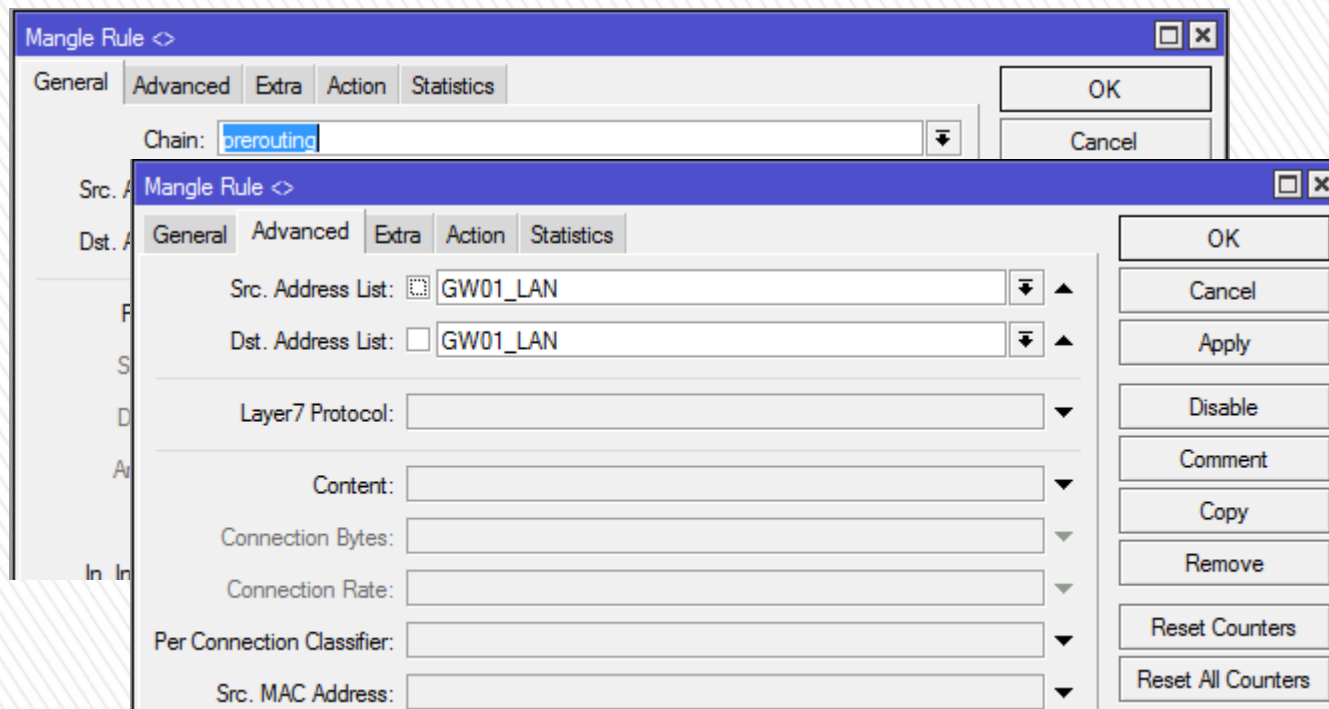
Remove

Reset Counters

Reset All Counters

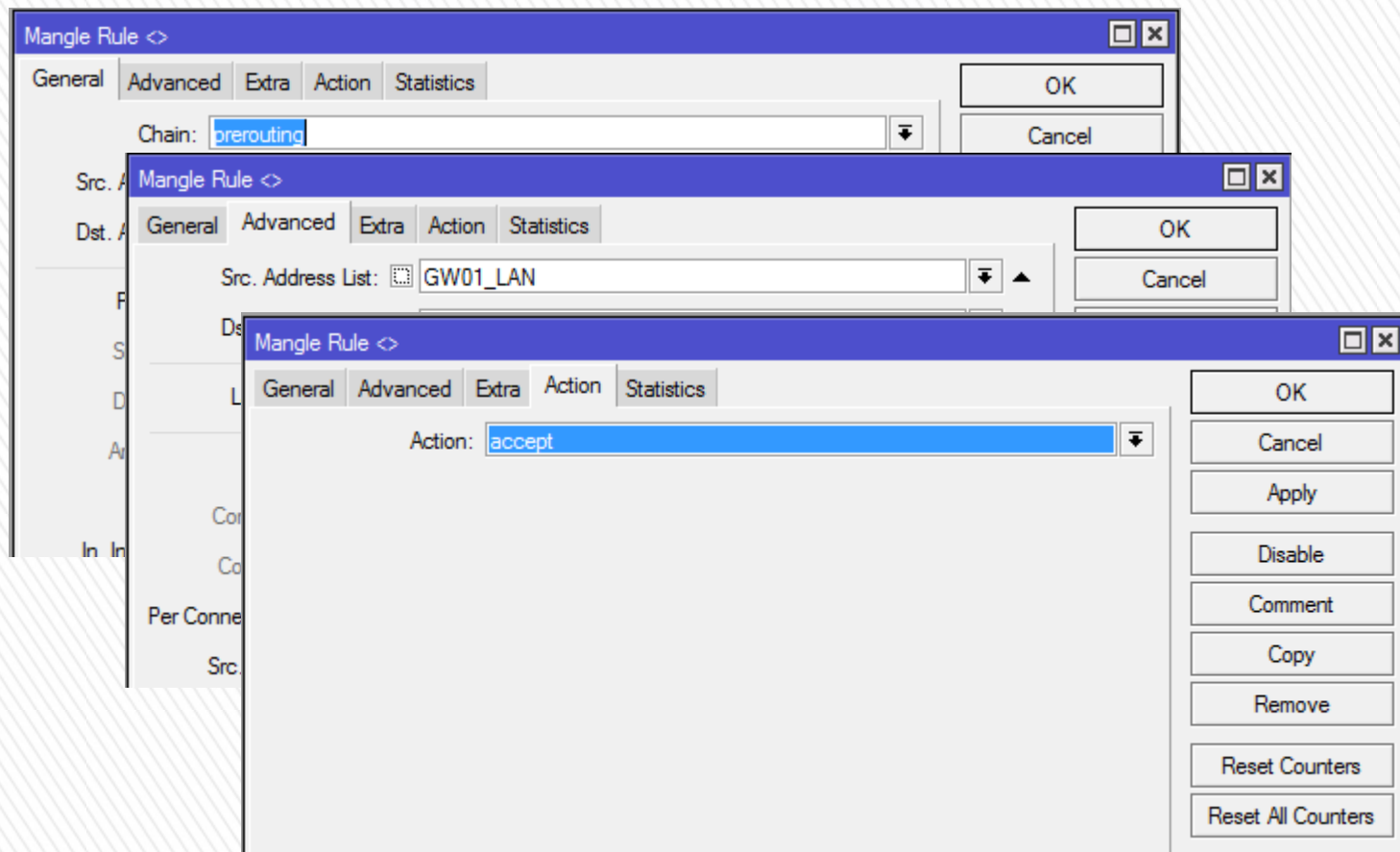
Mangle Rules #1





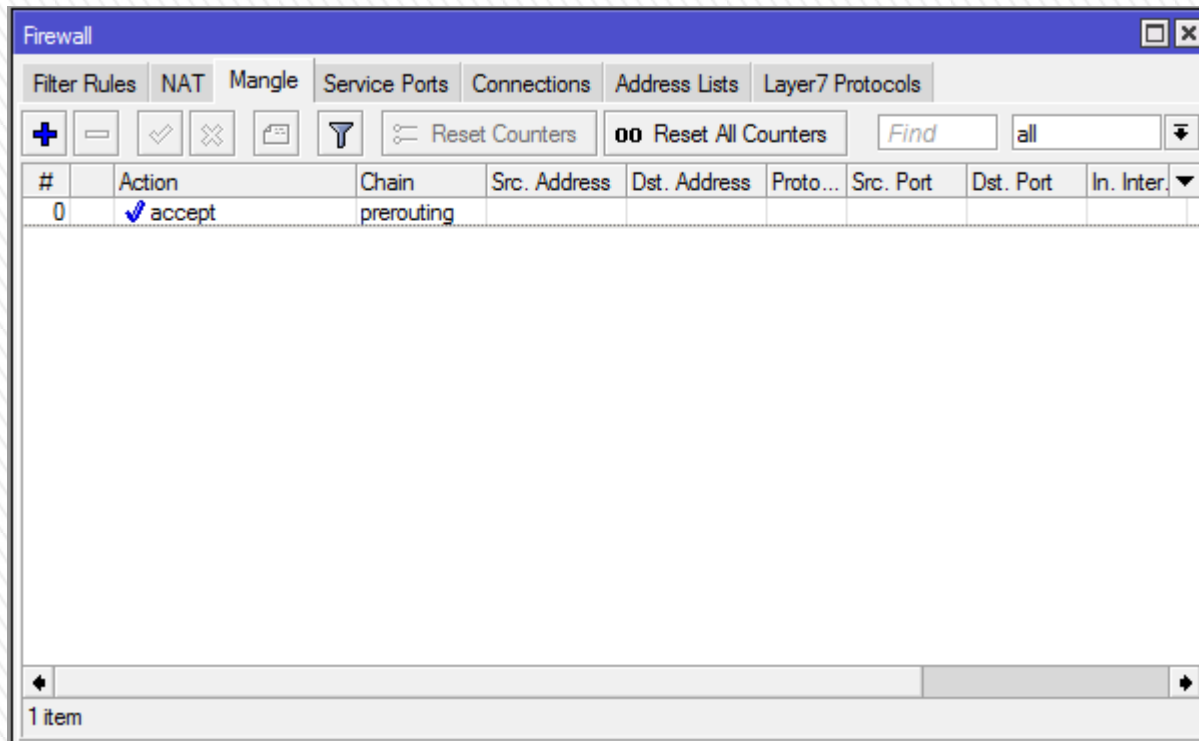
Mangle Rules #1





Mangle Rules #1





/ip firewall mangle

add chain=prerouting dst-address-list=GW01_LAN src-address-list=GW01_LAN

Mangle Rules #1



Mangle Rule <>

General Advanced Extra Action Statistics

Chain:

Src. Address:

Dst. Address:

Protocol:

Src. Port:

Dst. Port:

Any. Port:

P2P:

In. Interface: ☐

Out. Interface:

Packet Mark:

Connection Mark: ☐

Routing Mark:

Routing Table:

Connection Type:

Connection State:

OK

Cancel

Apply

Disable

Comment

Copy

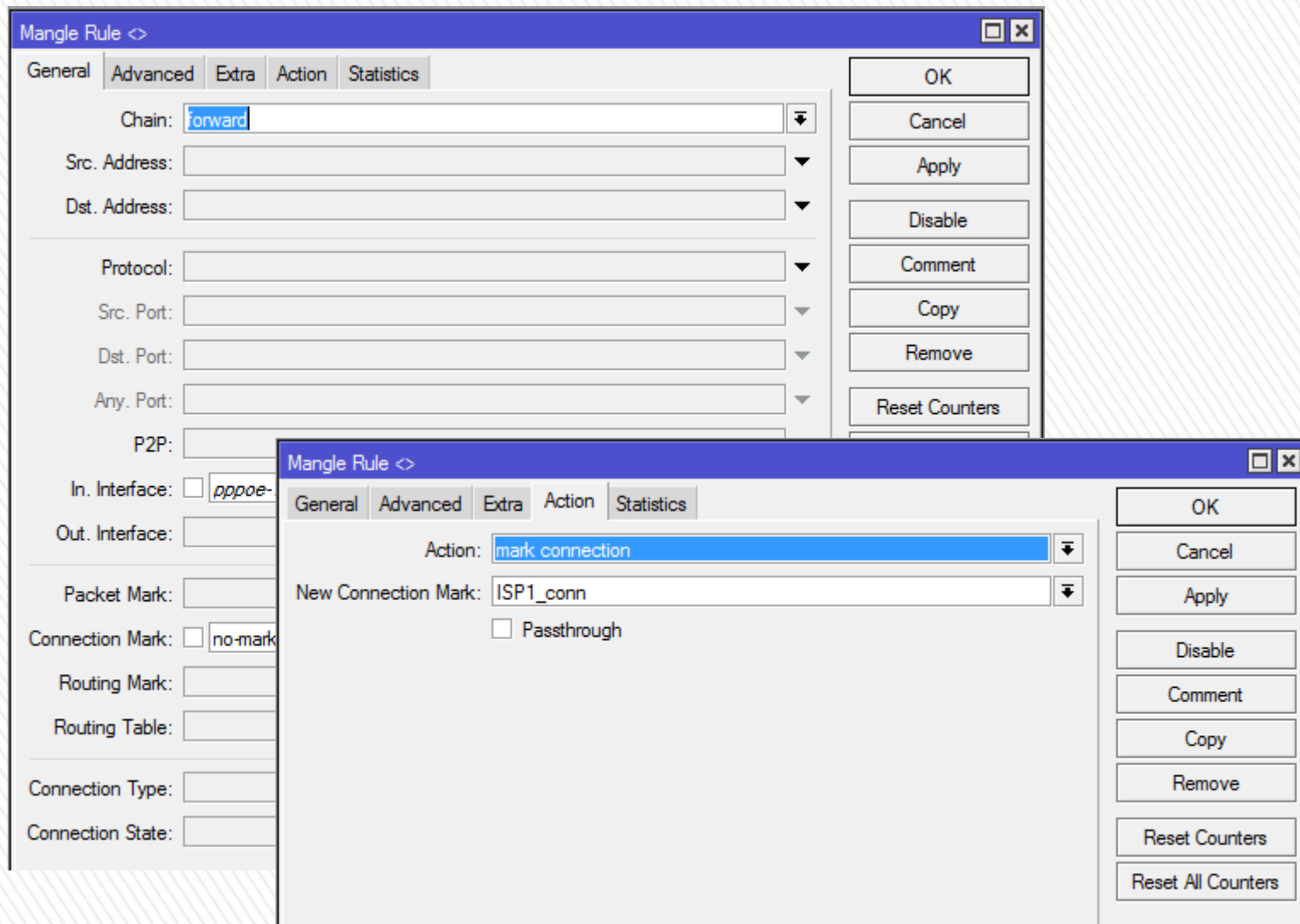
Remove

Reset Counters

Reset All Counters

Mangle Rules #2





Mangle Rules #2



Firewall									
<div> <div>Filter Rules</div> <div>NAT</div> <div>Mangle</div> <div>Service Ports</div> <div>Connections</div> <div>Address Lists</div> <div>Layer7 Protocols</div> </div>									
<div> <div>+</div> <div>-</div> <div>✓</div> <div>✗</div> <div>📄</div> <div>🔍</div> <div>Reset Counters</div> <div>00 Reset All Counters</div> <div>Find</div> <div>all</div> <div>⌵</div> </div>									
#	Action	Chain	Src. Address	Dst. Address	Proto...	Src. Port	Dst. Port	In. Inter.	▼
0	✓ accept	prerouting							
1	🔧 mark connection	forward						pppoe-1	
2	🔧 mark connection	forward						pppoe-2	
3	🔧 mark connection	forward						pppoe-3	
4	🔧 mark connection	forward						pppoe-4	

```
/ip firewall mangle
```

```
add action=mark-connection chain=forward connection-mark=no-mark \
    in-interface=pppoe-1 new-connection-mark=ISP1_conn passthrough=no
```



```
add action=mark-connection chain=forward connection-mark=no-mark \
    in-interface=pppoe-2 new-connection-mark=ISP2_conn passthrough=no
```

```
add action=mark-connection chain=forward connection-mark=no-mark \
    in-interface=pppoe-3 new-connection-mark=ISP3_conn passthrough=no
```

```
add action=mark-connection chain=forward connection-mark=no-mark \
    in-interface=pppoe-4 new-connection-mark=ISP4_conn passthrough=no
```

Mangle Rules #2



Mangle Rule  

General Advanced Extra Action Statistics

Chain: ▼

Src. Address: ▼

Dst. Address: ▼

Protocol: ▼

Src. Port: ▼

Dst. Port: ▼

Any. Port: ▼

P2P: ▼

In. Interface: ☐ ▼ ▲

Out. Interface: ▼

Packet Mark: ▼

Connection Mark: ☐ ▼ ▲

Routing Mark: ▼

Routing Table: ▼

OK

Cancel

Apply

Disable

Comment

Copy

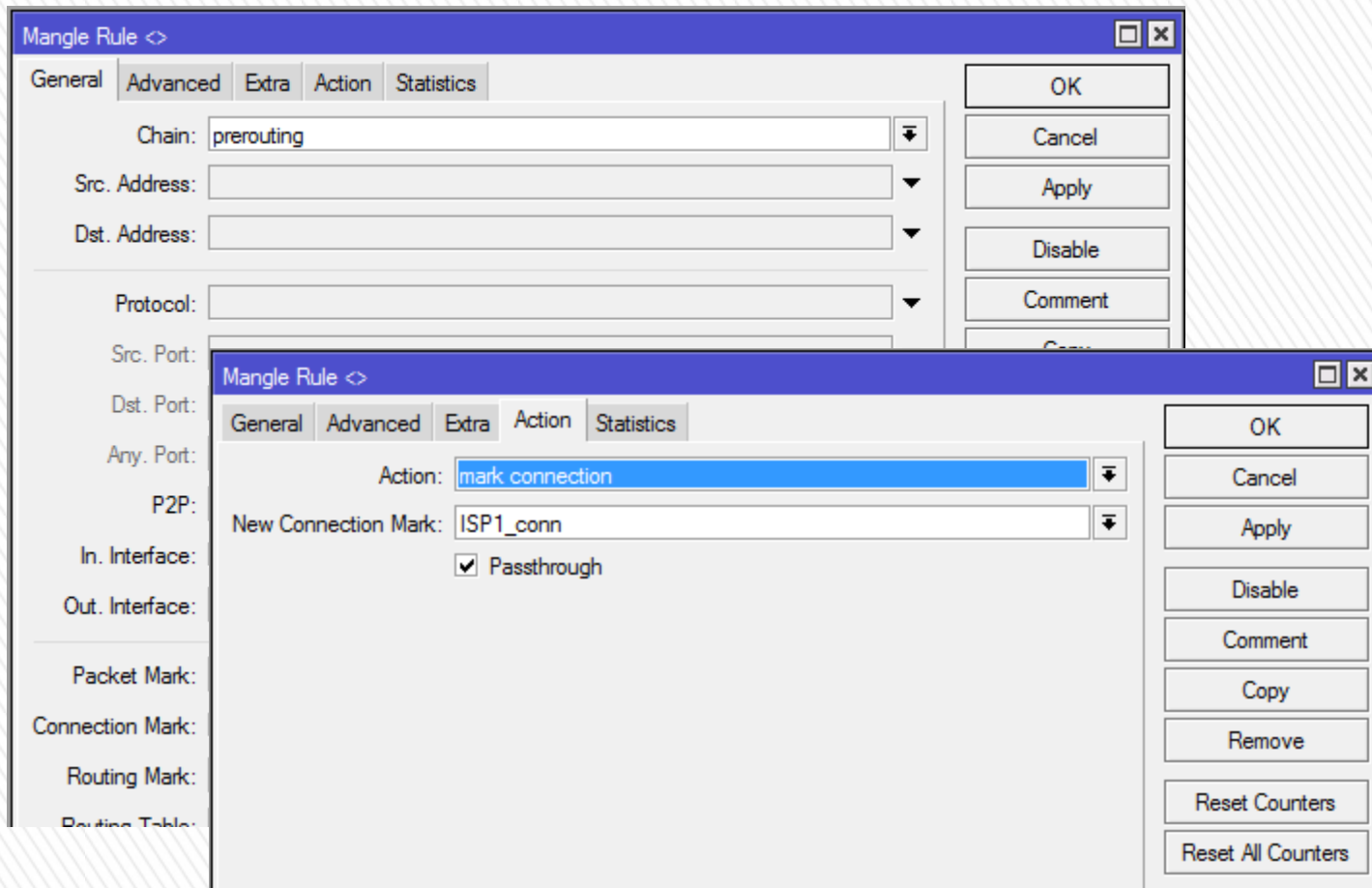
Remove

Reset Counters

Reset All Counters

Mangle Rules #3





Mangle Rules #3



Firewall

Filter Rules

NAT

Mangle

Service Ports

Connections

Address Lists

Layer7 Protocols

+

-

✓

✗

📄

🔍

🔄 Reset Counters

🚫 Reset All Counters

#	Action	Chain	Src. Address	Dst. Address	Proto...	Src. Port	Dst. Port	In. Inter...	Out. Int...	Bytes	Packets
0	✓ accept	prerouting								0 B	0
1	🔧 mark connection	forward						pppoe-1		0 B	0
2	🔧 mark connection	forward						pppoe-2		0 B	0
3	🔧 mark connection	forward						pppoe-3		0 B	0
4	🔧 mark connection	forward						pppoe-4		0 B	0
5	🔧 mark connection	prerouting						pppoe-1		0 B	0
6	🔧 mark connection	prerouting						pppoe-2		0 B	0
7	🔧 mark connection	prerouting						pppoe-3		0 B	0
8	🔧 mark connection	prerouting						pppoe-4		0 B	0

```
/ip firewall mangle
```

```
add action=mark-connection chain=prerouting connection-mark=no-mark \
```

```
in-interface=pppoe-1 new-connection-mark=ISP1_conn
```

```
add action=mark-connection chain=prerouting connection-mark=no-mark \
```

```
in-interface=pppoe-2 new-connection-mark=ISP2_conn
```

```
add action=mark-connection chain=prerouting connection-mark=no-mark \
```

```
in-interface=pppoe-3 new-connection-mark=ISP3_conn
```

```
add action=mark-connection chain=prerouting connection-mark=no-mark \
```

```
in-interface=pppoe-4 new-connection-mark=ISP4 conn
```

Mangle Rules #3



Mangle Rule <>

General Advanced Extra Action Statistics

Chain: prerouting

Src. Address:

Dst. Address:

Protocol:

Src. Port:

Dst. Port:

Any. Port:

P2P:

In. Interface: ☐ LAN

Out. Interface:

Packet Mark:

Connection Mark: ☐ no-mark

Routing Mark:

OK

Cancel

Apply

Disable

Comment

Copy

Remove

Reset Counters

Reset All Counters

Mangle Rules #4



Mangle Rule <>

General Advanced Extra Action Statistics

Chain: prerouting

Src. Address:

Dst. Address:

Protocol:

Src. Port:

Dst. Port:

Any. Port:

P2P:

In. Interface: ☐ LAN

Out. Interface:

Packet Mark:

Connection Mark: ☐ no-mark

Routing Mark:

OK

Cancel

Apply

Disable

Comment

Copy

Remove

Reset Counters

Reset All Counters

Mangle Rule <>

General Advanced Extra Action Statistics

Action: jump

Jump Target: policy_routing

OK

Cancel

Apply

Disable

Mangle Rules #4



Firewall									
Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols									
<div> + - ✓ ✗ 📄 🔍 Reset Counters 00 Reset All Counters Find <input type="text" value="all"/> ⌵ </div>									
#	Action	Chain	Src. Address	Dst. Address	Proto...	Src. Port	Dst. Port	In. Inter.	▼
0	✓ accept	prerouting							
1	🔧 mark connection	forward						pppoe-1	
2	🔧 mark connection	forward						pppoe-2	
3	🔧 mark connection	forward						pppoe-3	
4	🔧 mark connection	forward						pppoe-4	
5	🔧 mark connection	prerouting						pppoe-1	
6	🔧 mark connection	prerouting						pppoe-2	
7	🔧 mark connection	prerouting						pppoe-3	
8	🔧 mark connection	prerouting						pppoe-4	
9	🔧 jump	prerouting						LAN	

/ip firewall mangle

add action=jump chain=prerouting connection-mark=no-mark in-interface=LAN \

jump-target=policy_routing

Mangle Rules #4



Mangle Rule <>

General Advanced Extra Action Statistics

Chain: prerouting

Src. Address:

Dst. Address:

Protocol:

Src. Port:

Dst. Port:

Any. Port:

P2P:

In. Interface:

Out. Interface:

Packet Mark:

Connection Mark: ☐ ISP1_conn

Routing Mark:

OK

Cancel

Apply

Disable

Comment

Copy

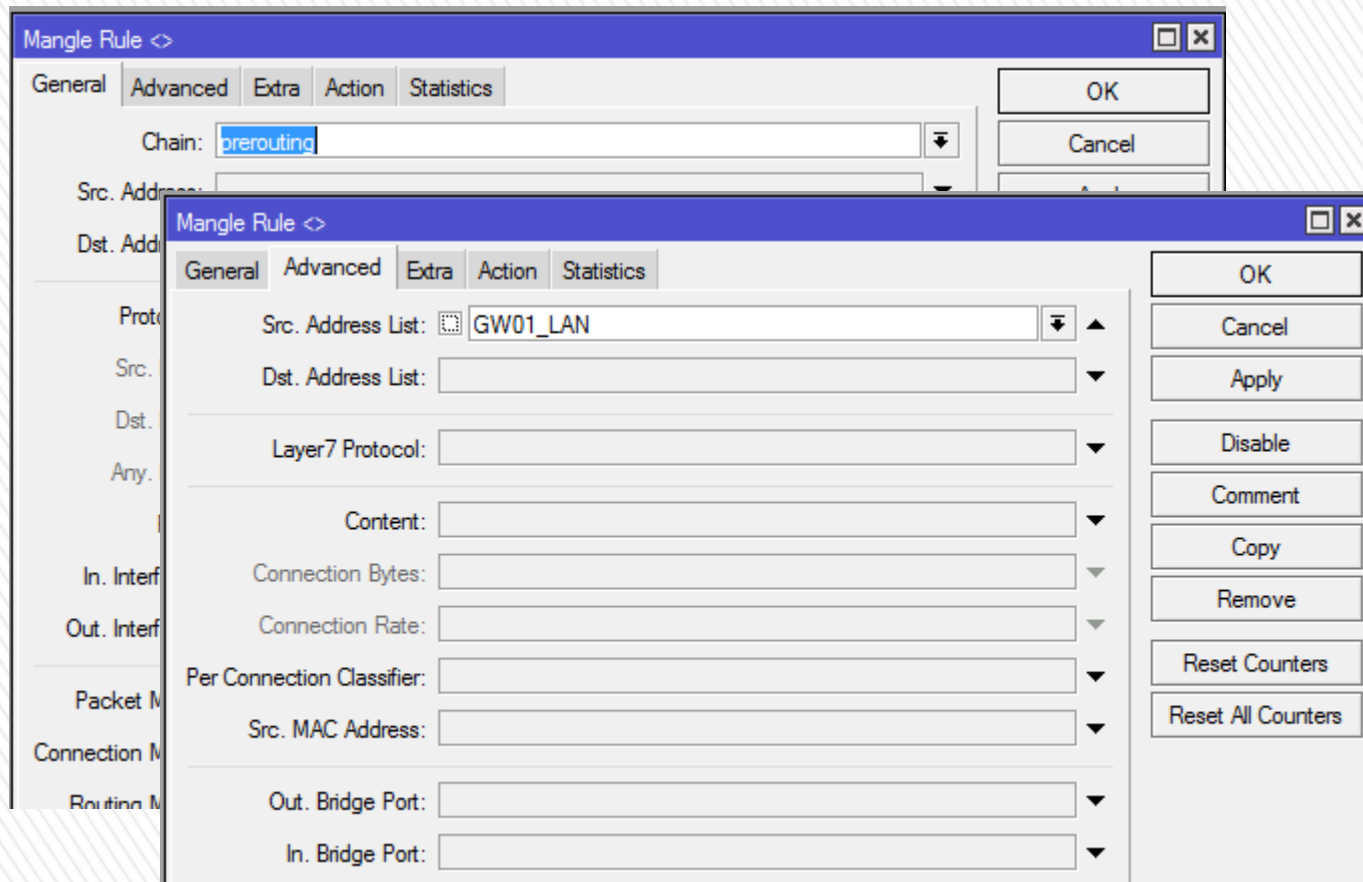
Remove

Reset Counters

Reset All Counters

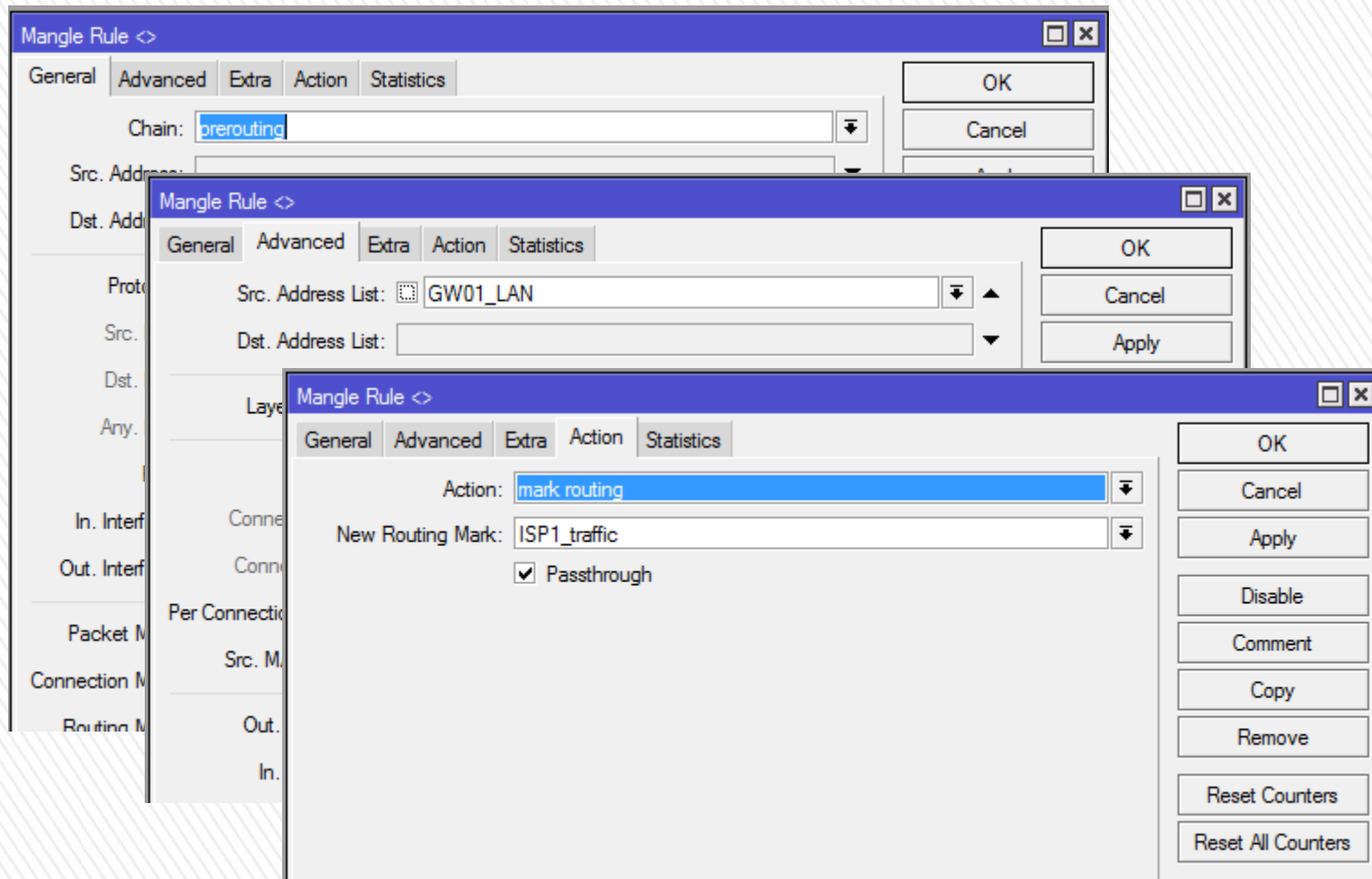
Mangle Rules #5





Mangle Rules #5





Mangle Rules #5



Firewall												
Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols												
<div> <div>+</div> <div>-</div> <div>✓</div> <div>✗</div> <div>📄</div> <div>🔍</div> <div>🔄 Reset Counters</div> <div>🔄 Reset All Counters</div> <div>Find</div> <div>all</div> <div>⌵</div> </div>												
#	Action	Chain	Src. Address	Dst. Address	Proto...	Src. Port	Dst. Port	In. Inter...	Out. Int...	Bytes	Packets	▼
0	✓ acc...	prerouting								15.1 MiB	199 973	
1	✗ mar...	forward						pppoe-1		0 B	0	
2	✗ mar...	forward						pppoe-2		0 B	0	
3	✗ mar...	forward						pppoe-3		0 B	0	
4	✗ mar...	forward						pppoe-4		0 B	0	
5	✗ mar...	prerouting						pppoe-1		0 B	0	
6	✗ mar...	prerouting						pppoe-2		0 B	0	
7	✗ mar...	prerouting						pppoe-3		0 B	0	
8	✗ mar...	prerouting						pppoe-4		0 B	0	
9	📄 jump	prerouting						LAN		499.3 KiB	5 830	
10	✓ mar...	prerouting								0 B	0	
11	✓ mar...	prerouting								0 B	0	
12	✓ mar...	prerouting								0 B	0	
13	✓ mar...	prerouting								1904 B	14	

/ip firewall mangle

```
add action=mark-routing chain=prerouting connection-mark=ISP1_conn \
    new-routing-mark=ISP1_traffic src-address-list=GW01_LAN
```



```
add action=mark-routing chain=prerouting connection-mark=ISP2_conn \
    new-routing-mark=ISP2_traffic src-address-list=GW01_LAN
```

```
add action=mark-routing chain=prerouting connection-mark=ISP3_conn \
    new-routing-mark=ISP3_traffic src-address-list=GW01_LAN
```

```
add action=mark-routing chain=prerouting connection-mark=ISP4_conn \
    new-routing-mark=ISP4_traffic src-address-list=GW01_LAN
```

Mangle Rules #5



Mangle Rule  

General Advanced Extra Action Statistics

Chain: ▼

Src. Address: ▼

Dst. Address: ▼

Protocol: ▼

Src. Port: ▼

Dst. Port: ▼

Any. Port: ▼

P2P: ▼

In. Interface: ▼

Out. Interface: ▼

Packet Mark: ▼

Connection Mark: ☐ ▼ ▲

Routing Mark: ▼

OK

Cancel

Apply

Disable

Comment

Copy

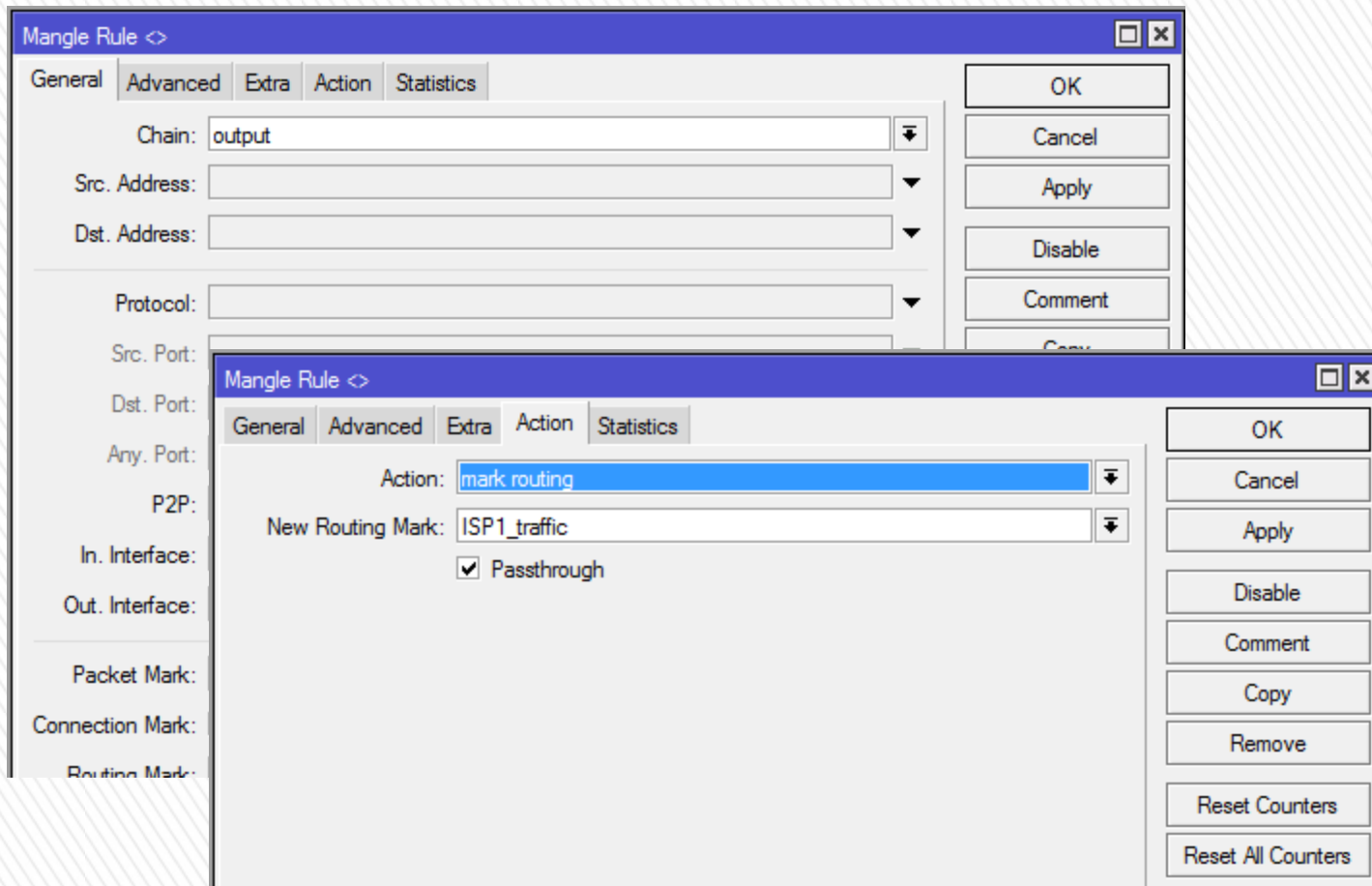
Remove

Reset Counters

Reset All Counters

Mangle Rules #6





Mangle Rules #6



Firewall											
Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols											
<div> + - ✓ ✗ 📄 🔍 Reset Counters 00 Reset All Counters Find all </div>											
#	Action	Chain	Src. Address	Dst. Address	Proto...	Src. Port	Dst. Port	In. Inter...	Out. Int...	Bytes	Pack...
3	mark conn...	forward						pppoe-3		0 B	
4	mark conn...	forward						pppoe-4		0 B	
5	mark conn...	prerouting						pppoe-1		0 B	
6	mark conn...	prerouting						pppoe-2		0 B	
7	mark conn...	prerouting						pppoe-3		0 B	
8	mark conn...	prerouting						pppoe-4		0 B	
9	jump	prerouting						LAN		540.8 KiB	
10	mark routing	prerouting								0 B	
11	mark routing	prerouting								0 B	
12	mark routing	prerouting								0 B	
13	mark routing	prerouting								1904 B	
14	mark routing	output								0 B	
15	mark routing	output								0 B	
16	mark routing	output								0 B	
17	mark routing	output								0 B	

/ip firewall mangle

add action=mark-routing chain=output connection-mark=ISP1_conn \

new-routing-mark=ISP1_traffic

add action=mark-routing chain=output connection-mark=ISP2_conn \

new-routing-mark=ISP2_traffic

add action=mark-routing chain=output connection-mark=ISP3_conn \



new-routing-mark=ISP3_traffic

add action=mark-routing chain=output connection-mark=ISP4_conn \

new-routing-mark=ISP4_traffic

Mangle Rules #6



Mangle Rule  

General Advanced Extra Action Statistics

Chain: ▼

Src. Address: ▼

Dst. Address: ▼

Protocol: ▼

Src. Port: ▼

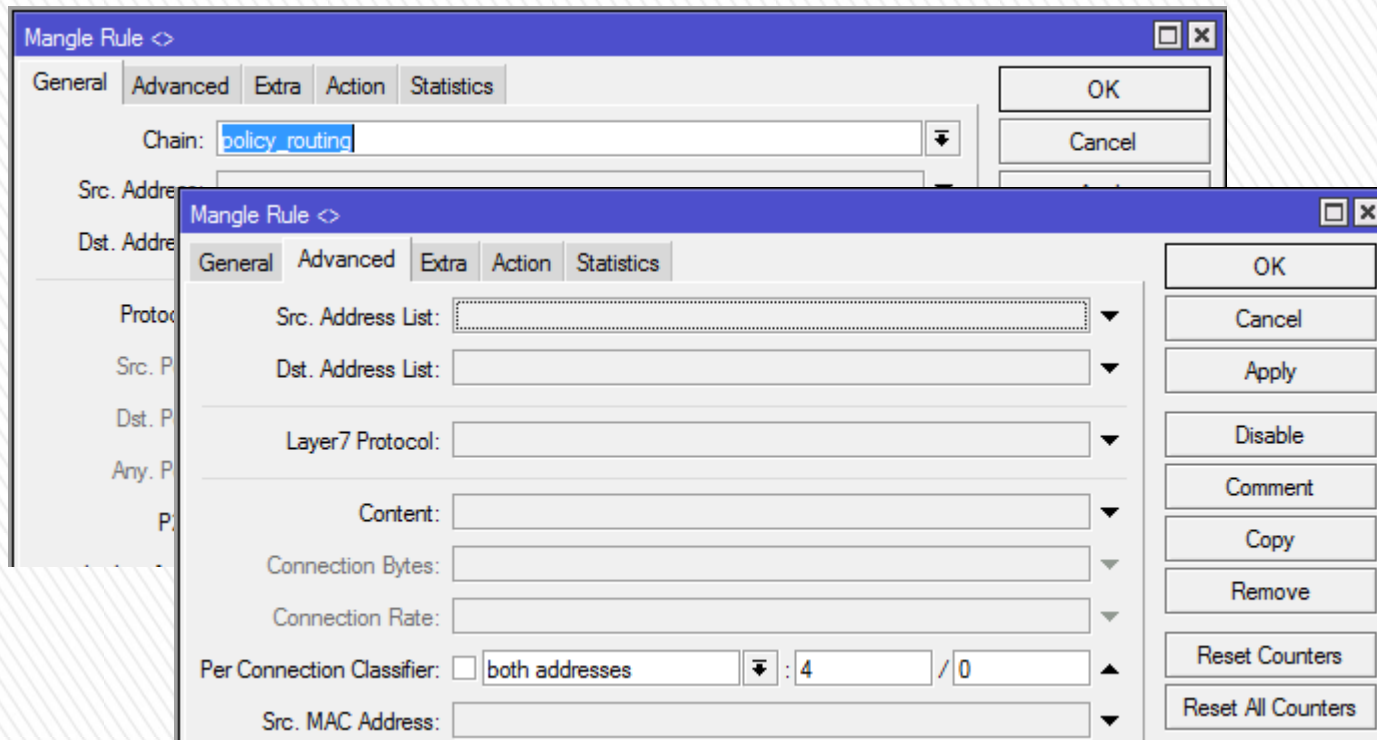
Dst. Port: ▼

Any. Port: ▼

P2P: ▼

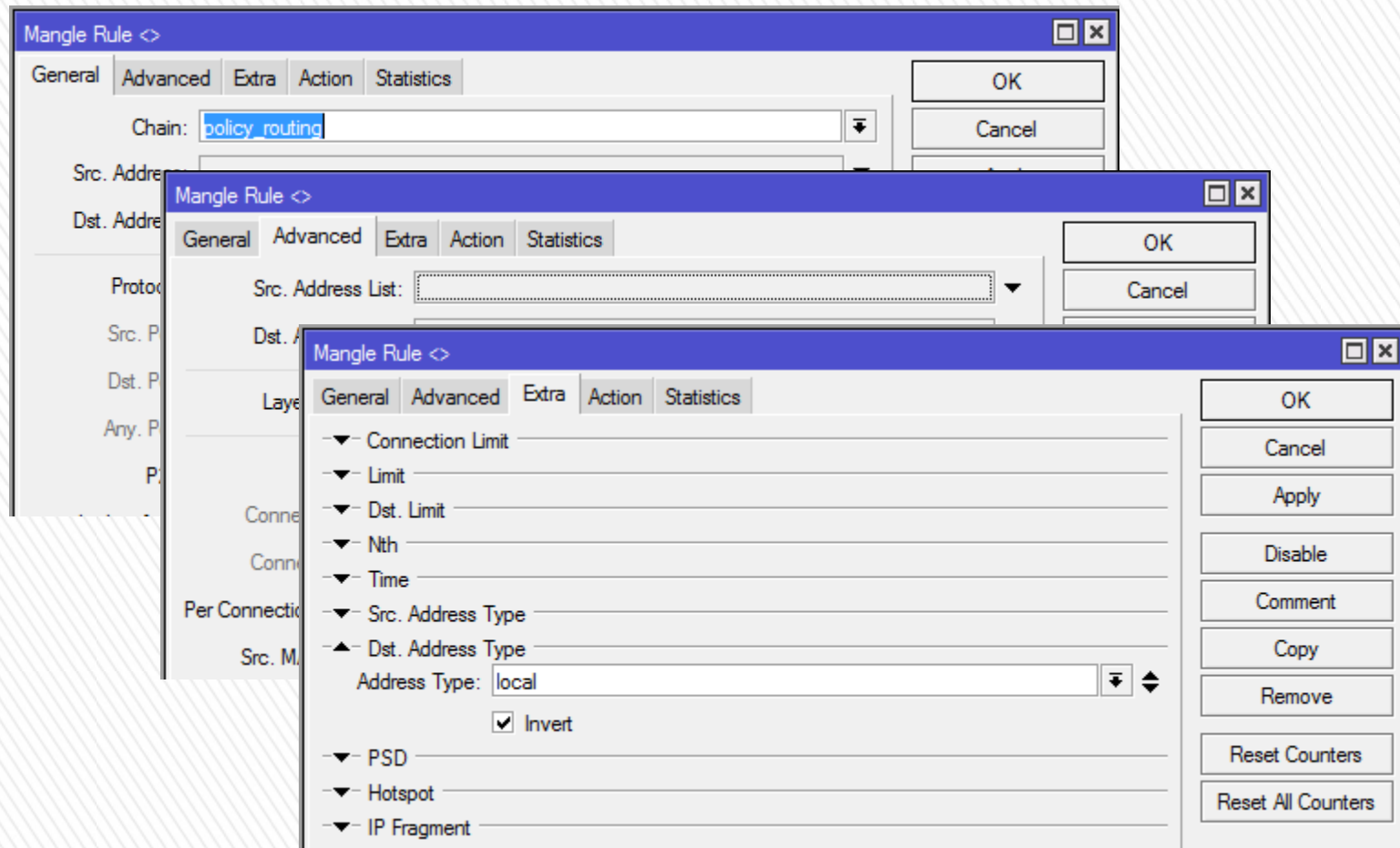
Mangle Rules #7





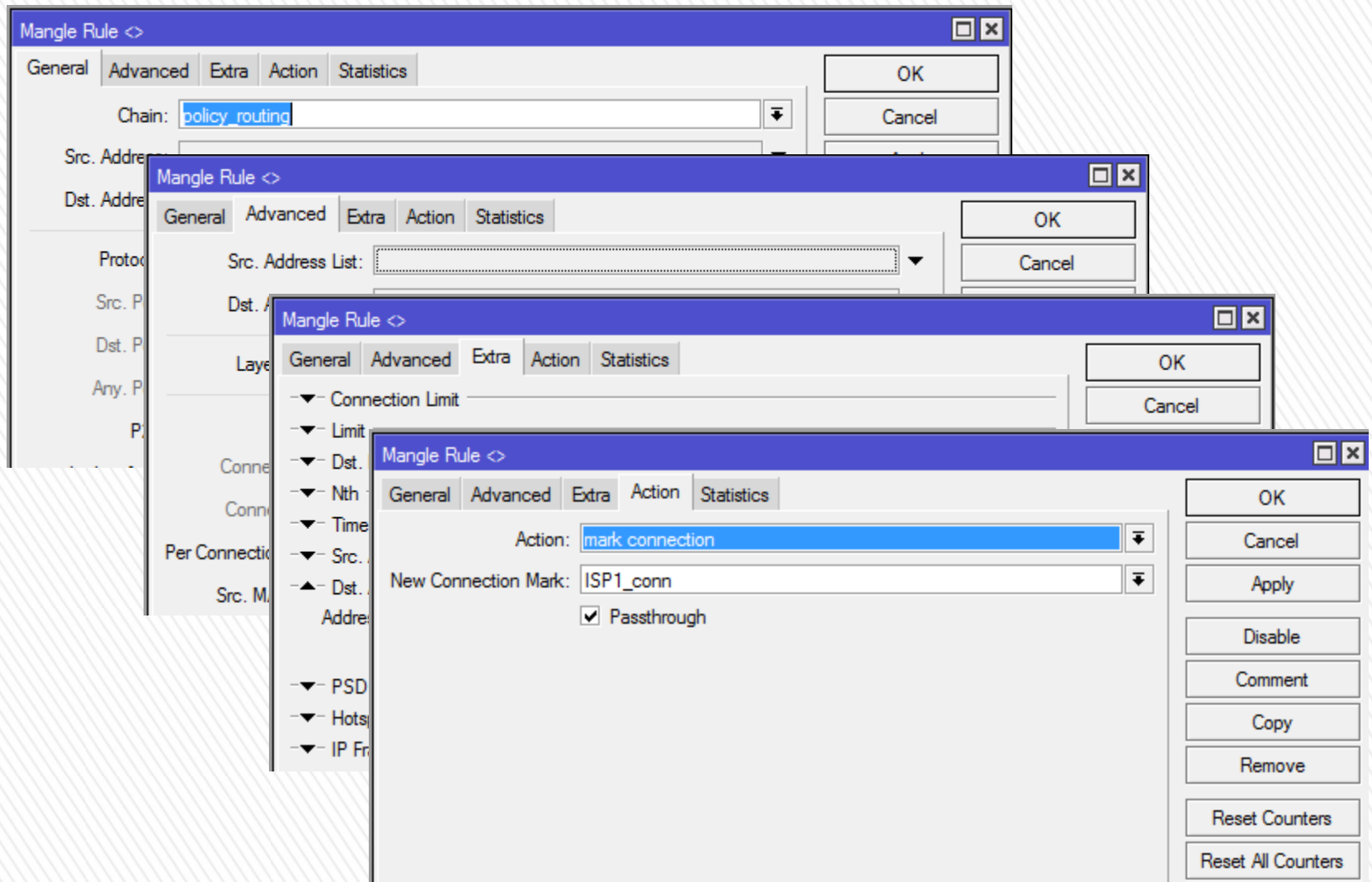
Mangle Rules #7





Mangle Rules #7





Mangle Rules #7



Firewall										
Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols										
<div> <div>+</div> <div>-</div> <div>✓</div> <div>✗</div> <div>📄</div> <div>🔍</div> <div>🔄</div> <div>Reset Counters</div> <div>00 Reset All Counters</div> <div>Find</div> <div>all</div> <div>⌵</div> </div>										
#	Action	Chain	Src. Address	Dst. Address	Proto...	Src. Port	Dst. Port	In. Inter...	Out. Int...	Bytes
7	🔧 mark connection	prerouting						pppoe-3		0
8	🔧 mark connection	prerouting						pppoe-4		0
9	🔗 jump	prerouting						LAN		605.5 K
10	🔧 mark routing	prerouting								0
11	🔧 mark routing	prerouting								0
12	🔧 mark routing	prerouting								0
13	🔧 mark routing	prerouting								2040
14	🔧 mark routing	output								0
15	🔧 mark routing	output								0
16	🔧 mark routing	output								0
17	🔧 mark routing	output								0
18	🔧 mark connection	policy_routing								540
19	🔧 mark connection	policy_routing								490
20	🔧 mark connection	policy_routing								9.8 K
21	🔧 mark connection	policy_routing								458

/ip firewall mangle

```
add action=mark-connection chain=policy_routing dst-address-type=!local \
    new-connection-mark=ISP1_conn per-connection-classifier=\
    both-addresses:4/0
```

```
add action=mark-connection chain=policy_routing dst-address-type=!local \
    new-connection-mark=ISP2_conn per-connection-classifier=\
    both-addresses:4/1
```

```
add action=mark-connection chain=policy_routing dst-address-type=!local \
    new-connection-mark=ISP3_conn per-connection-classifier=\
    both-addresses:4/2
```

```
add action=mark-connection chain=policy_routing dst-address-type=!local \
    new-connection-mark=ISP4_conn per-connection-classifier=\
    both-addresses:4/3
```

Mangle Rules #7



Route <0.0.0.0/0>

General Attributes

Dst. Address: 0.0.0.0/0

Gateway: pppoe-1 unreachable

Check Gateway: arp

Type: unicast

Distance: 1

Scope: 30

Target Scope: 10

Routing Mark: ISP1_traffic

Pref. Source:

OK
Cancel
Apply
Disable
Comment
Copy
Remove

enabled active static

Route



Route <0.0.0.0/0>

General Attributes

Dst. Address: 0.0.0.0/0

Gateway: pppoe-1 unreachable

Check Gateway: arp

Type: unicast

Distance: 2

Scope: 30

Target Scope: 10

Routing Mark:

Pref. Source:

OK
Cancel
Apply
Disable
Comment
Copy
Remove

enabled active static

Route



Route List						
Routes						
<div> <div>+</div> <div>-</div> <div>✓</div> <div>✗</div> <div>📄</div> <div>🔍</div> <div>Find</div> <div>all</div> <div>▼</div> </div>						
	Dst. Address	Gateway	Distance	Routing Mark	Pref. Source	▼
DC	▶ 192.168.5.0/24	ADSL1 unreachable	255		192.168.5.254	
DC	▶ 192.168.6.0/24	ADSL2 unreachable	255		192.168.6.254	
DC	▶ 192.168.7.0/24	ADSL3 unreachable	255		192.168.7.254	
DC	▶ 192.168.8.0/24	ADSL4 unreachable	255		192.168.8.254	
DAC	▶ 192.168.1.0/24	LAN reachable	0		192.168.1.1	
S	▶ 0.0.0.0/0	pppoe-1 unreachable	1	ISP1_traffic		
S	▶ 0.0.0.0/0	pppoe-1 unreachable	2			
S	▶ 0.0.0.0/0	pppoe-2 unreachable	1	ISP2_traffic		
S	▶ 0.0.0.0/0	pppoe-2 unreachable	3			
S	▶ 0.0.0.0/0	pppoe-3 unreachable	1	ISP3_traffic		
S	▶ 0.0.0.0/0	pppoe-3 unreachable	4			
S	▶ 0.0.0.0/0	pppoe-4 unreachable	1	ISP4_traffic		
S	▶ 0.0.0.0/0	pppoe-4 unreachable	5			

/ip route

add check-gateway=arp distance=1 gateway=pppoe-1 routing-mark=ISP1_traffic

add check-gateway=arp distance=1 gateway=pppoe-2 routing-mark=ISP2_traffic

add check-gateway=arp distance=1 gateway=pppoe-3 routing-mark=ISP3_traffic

add check-gateway=arp distance=1 gateway=pppoe-4 routing-mark=ISP4_traffic

add check-gateway=arp distance=2 gateway=pppoe-1

add check-gateway=arp distance=3 gateway=pppoe-2

add check-gateway=arp distance=4 gateway=pppoe-3

add check-gateway=arp distance=5 gateway=pppoe-4

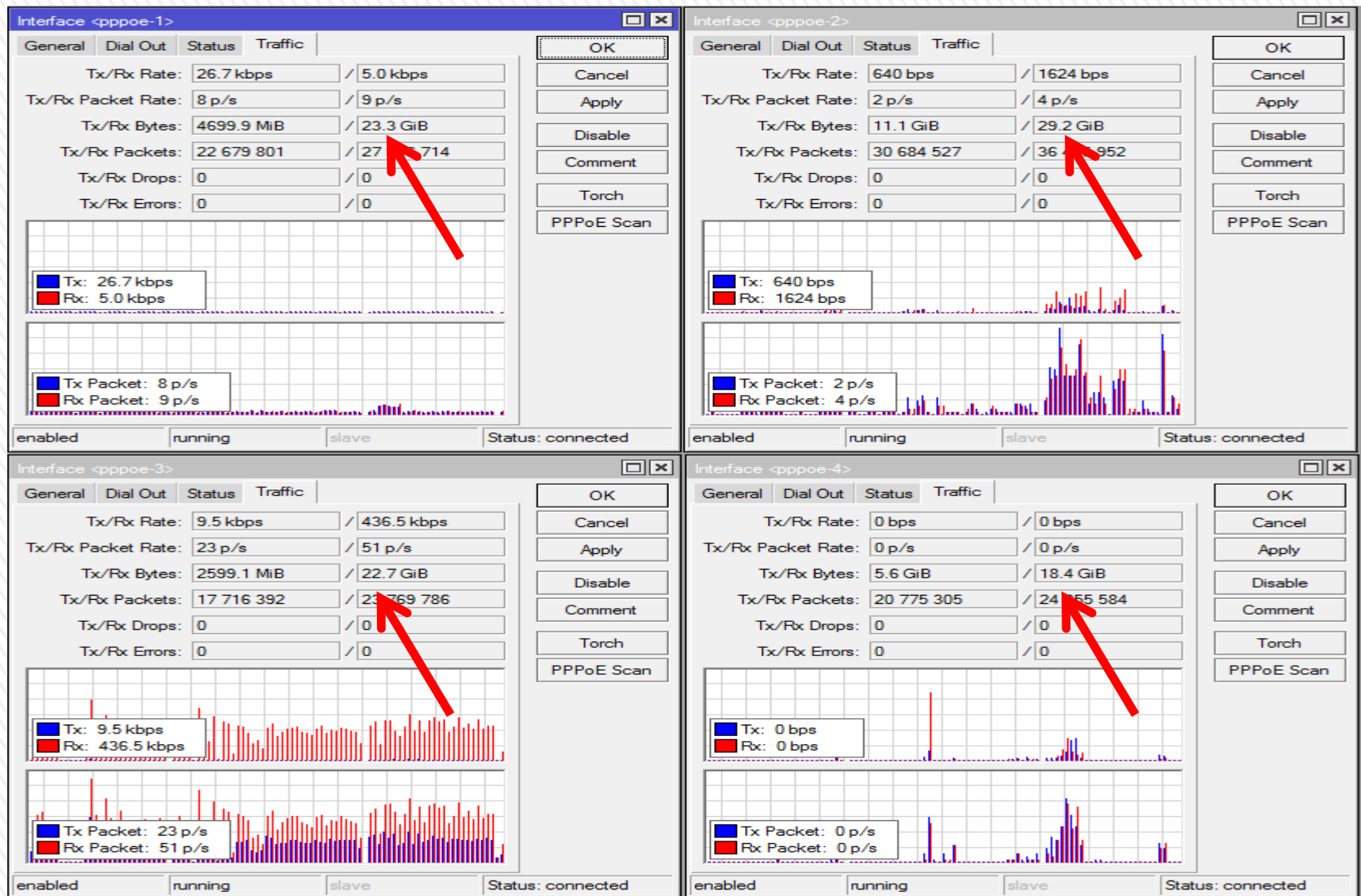
Route



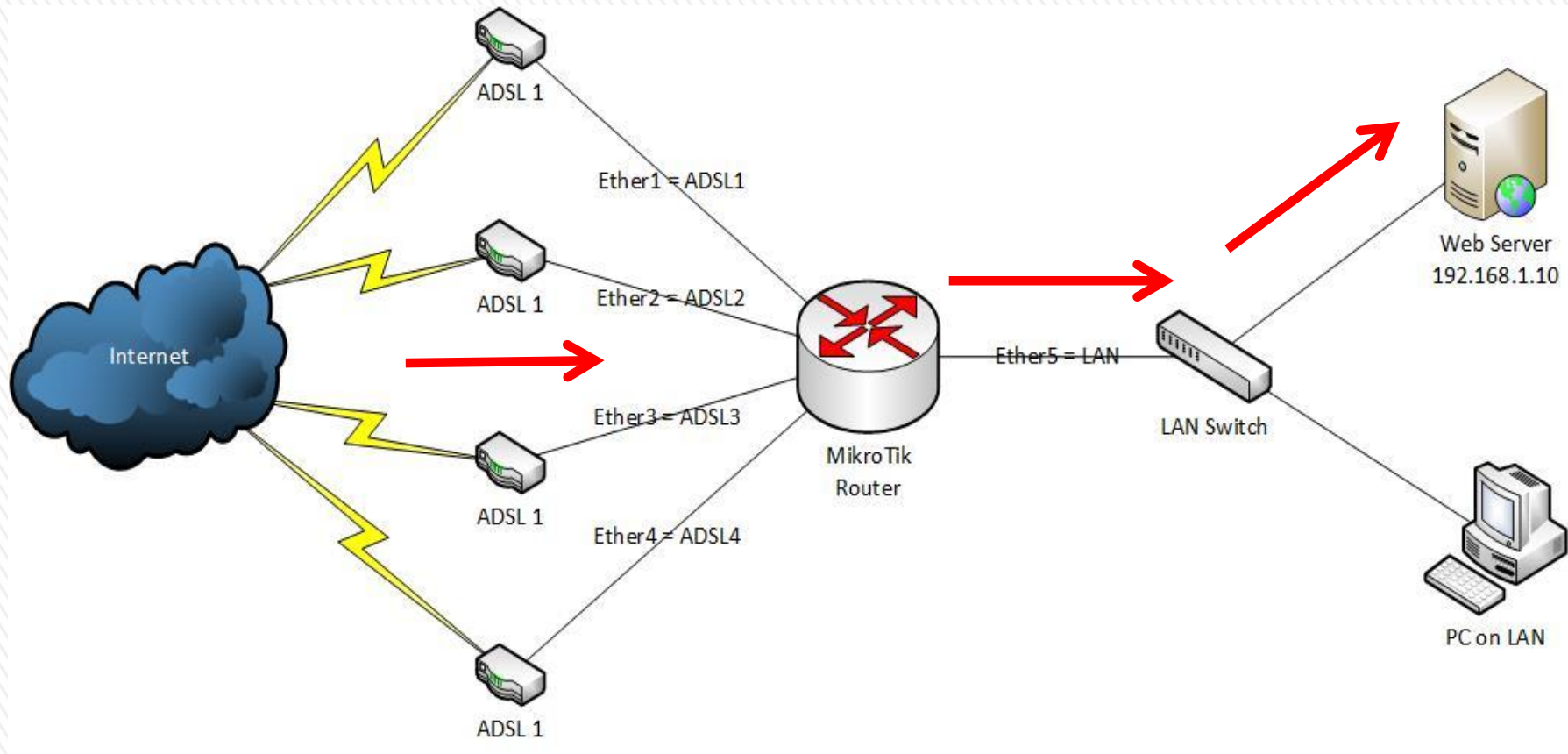


Sacrifice Sir?





Actual screen shots from a load balance configuration in production with 4 WAN connections.



Port Forwarding



NAT Rule <80>

General Advanced Extra Action Statistics

Chain:

Src. Address:

Dst. Address:

Protocol: ☐ 6 (tcp)

Src. Port:

Dst. Port: ☐ 80

Any. Port:

In. Interface: !

Out. Interface:

Packet Mark:

Connection Mark:

Routing Mark:

Routing Table:

Connection Type:

OK

Cancel

Apply

Disable

Comment

Copy

Remove

Reset Counters

Reset All Counters

Port Forwarding



NAT Rule <80>

General Advanced Extra Action Statistics

Chain:

Src. Address:

Dst. Address:

Protocol: ☐ 6 (tcp)

Src. Port:

Dst. Port: ☐ 80

Any. Port:

In. Interface: !

Out. Interface:

Packet Mark:

Connection Mark:

Routing Mark:

Routing Table:

Connection Type:

OK

Cancel

Apply

Disable

Comment

Copy

Remove

NAT Rule <80>

General Advanced Extra Action Statistics

Action:

To Addresses:

To Ports:

OK

Cancel

Apply

Disable

Comment

Copy

Remove

Reset Counters

Reset All Counters

Port Forwarding



Firewall											
Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols											
<div> <div> <div>+</div> <div>-</div> <div>✓</div> <div>✗</div> <div>📄</div> <div>🔍</div> <div>🔄</div> <div>Reset Counters</div> <div>00 Reset All Counters</div> <div>Find</div> <div>all</div> <div>⌵</div> </div> </div>											
#	Action	Chain	Src. Address	Dst. Address	Proto...	Src. Port	Dst. Port	In. Inter...	Out. Int...	Bytes	Pack
0	masquerade	srcnat							pppoe-1	0 B	
1	masquerade	srcnat							pppoe-2	0 B	
2	masquerade	srcnat							pppoe-3	0 B	
3	masquerade	srcnat							pppoe-4	0 B	
::: Port Forward tcp 80 to Mail Server 192.168.1.10											
4	dst-nat	dstnat			6 (tcp)		80	!LAN		0 B	
::: Port Forward tcp 443 to Mail Server 192.168.1.10											
5	dst-nat	dstnat			6 (tcp)		80	!LAN		0 B	

/ip firewall nat

add action=dst-nat chain=dstnat comment=\

"Port Forward tcp 80 to Mail Server 192.168.1.10" dst-port=80 \

in-interface=!LAN protocol=tcp to-addresses=192.168.1.10 to-ports=80

add action=dst-nat chain=dstnat comment=\

"Port Forward tcp 443 to Mail Server 192.168.1.10" dst-port=443 \

in-interface=!LAN protocol=tcp to-addresses=192.168.1.10 to-ports=443

Port Forwarding



Problems? Why would there be any problems?

Problems



HTTPS?

Certain secure websites don't work.

e.g. Internet Banking with two factor authentication

(PIN then Username and Password)

Problems



Mangle Rule <443>

General Advanced Extra Action Statistics

Chain: prerouting

Src. Address:

Dst. Address:

Protocol: ☐ 6 (tcp)

Src. Port:

Dst. Port: ☐ 443

Any. Port:

P2P:

In. Interface:

Out. Interface:

OK

Cancel

Apply

Disable

Comment

Copy

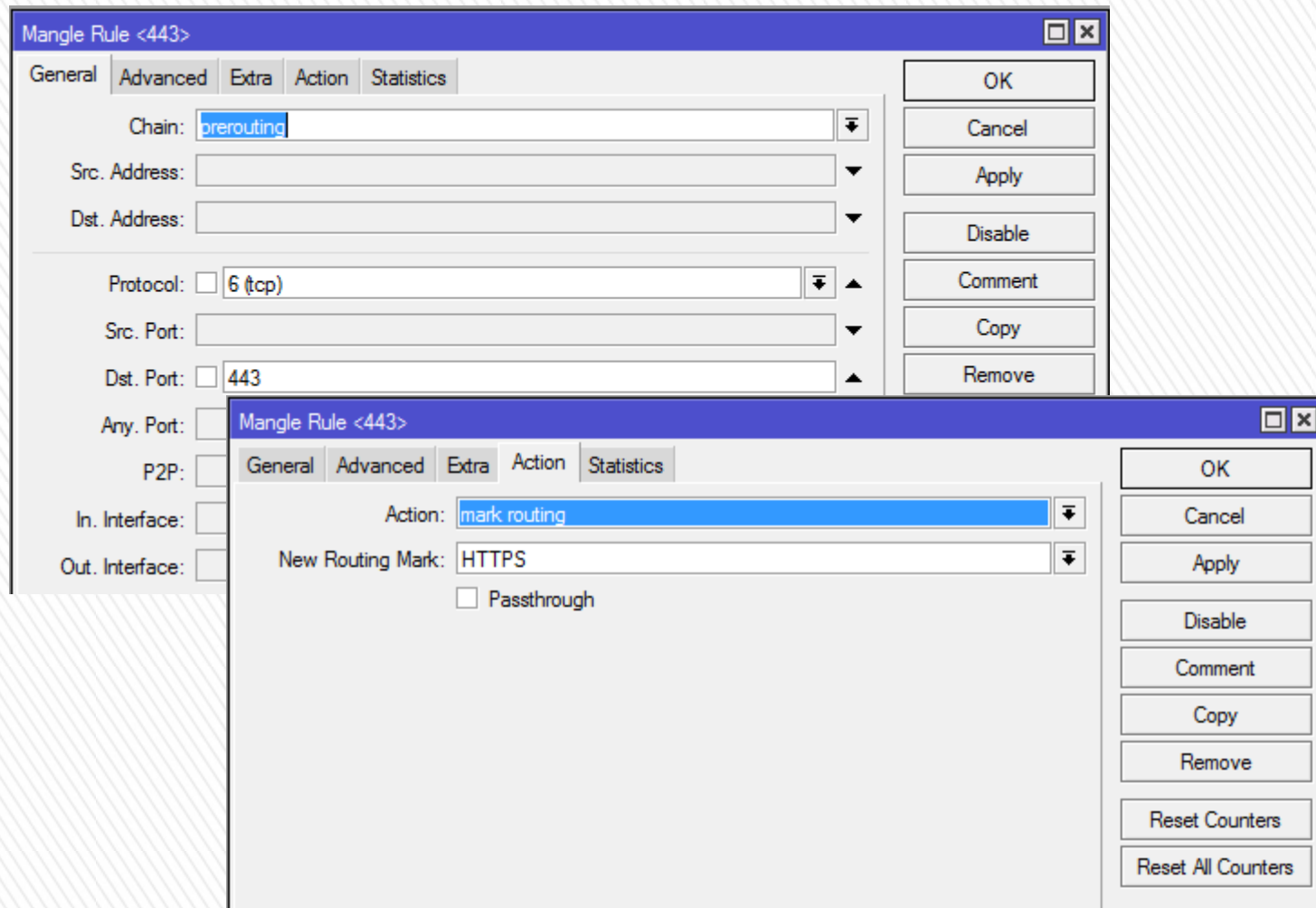
Remove

Reset Counters

Reset All Counters

Problems





Problems



Firewall											
Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols											
+ - ✓ ✗ 📁 🏠 00 Reset Counters 00 Reset All Counters Find all											
#	Action	Chain	Src. Address	Dst. Address	Proto...	Src. Port	Dst. Port	In. Inter...	Out. Int...	Bytes	Packets
0	✓ mark routing	prerouting			6 (tcp)		443			7.5 GiB	11 678 300
1	✓ accept	prerouting								72.5 MiB	1 030 121
2	✓ mark connection	forward						pppoe-1		0 B	0
3	✓ mark connection	forward						pppoe-2		0 B	0
4	✓ mark connection	forward						pppoe-3		0 B	0
5	✓ mark connection	forward						pppoe-4		0 B	0
6	✓ mark connection	forward						pppoe-5		0 B	0

/ip firewall mangle

add action=mark-routing chain=prerouting disabled=no dst-port=443 \
 new-routing-mark=HTTPS passthrough=no protocol=tcp

Problems



Route <0.0.0.0/0>

General Attributes

Dst. Address: 0.0.0.0/0

Gateway: pppoe-1 reachable

Check Gateway: arp

Type: unicast

Distance: 7

Scope: 30

Target Scope: 10

Routing Mark: HTTPS

Pref. Source:

OK
Cancel
Apply
Disable
Comment
Copy
Remove

enabled active static

Problems



Route List							
Routes							
Nexthops Rules VRF							
<div> <div>+</div> <div>-</div> <div>✓</div> <div>✗</div> <div>📁</div> <div>🔍</div> </div> <div>Find all</div>							
	Dst. Address	#	Gateway	Distance	Routing Mark	Pref. Source	
AS	▶ 0.0.0.0/0		pppoe-1 reachable	1	ISP1_traffic		
AS	▶ 0.0.0.0/0		pppoe-2 reachable	1	ISP2_traffic		
AS	▶ 0.0.0.0/0		pppoe-3 reachable	1	ISP3_traffic		
AS	▶ 0.0.0.0/0		pppoe-4 reachable	1	ISP4_traffic		
AS	▶ 0.0.0.0/0		pppoe-5 reachable	1	ISP5_traffic		
AS	▶ 0.0.0.0/0		pppoe-1 reachable	2			
S	▶ 0.0.0.0/0		pppoe-2 reachable	3			
S	▶ 0.0.0.0/0		pppoe-3 reachable	4			
S	▶ 0.0.0.0/0		pppoe-4 reachable	5			
S	▶ 0.0.0.0/0		pppoe-5 reachable	6			
AS	▶ 0.0.0.0/0		pppoe-2 reachable	7	HTTPS		
S	▶ 0.0.0.0/0		pppoe-5 reachable	8	HTTPS		

/ip route

add check-gateway=arp disabled=no distance=7 dst-address=0.0.0.0/0 gateway=\pppoe-1 routing-mark=HTTPS scope=30 target-scope=10

add check-gateway=arp disabled=no distance=8 dst-address=0.0.0.0/0 gateway=\pppoe-2 routing-mark=HTTPS scope=30 target-scope=10

add check-gateway=arp disabled=no distance=9 dst-address=0.0.0.0/0 gateway=\pppoe-3 routing-mark=HTTPS scope=30 target-scope=10

add check-gateway=arp disabled=no distance=10 dst-address=0.0.0.0/0 gateway=\pppoe-5 routtng-mark=HTTPS scope=30 target-scope=10

Problems



Help?

1. Make my solution more efficient and allow HTTPS traffic to Load Balance properly.
2. How to Load Balance with Web Proxy.

Assistance needed..



Simple User Traffic Logs

1. MikroTik Router
2. Raspberry Pi

Setup a Raspberry Pi as a Web Proxy (no caching) for Monitoring Internet Usage.

Next Project..



David Bisschoff

<http://mikrotik.Bisschoff.com>

Thank You!

