



FASTPATH PERFORMANCE



Perkenalan



- **Pujo Déwobroto**
- Citraweb Nusa Infomedia
 - Mikrotik distributor, training partner (mikrotik.co.id)
 - ISP (citra.net.id)
 - Web developer (citra.web.id)
- MTCNA, MTCTCE, MTCWE, MTCUME, MTCRE, MTCINE, TR0132

Fastpath**

Merupakan fitur pada mikrotik v6 untuk meneruskan paket tanpa banyak pengolahan di sisi linux kernel / software

- CPU load reduce
- Faster speed

*** Syarat dan ketentuan berlaku**

Interface

Routerboard	Interfaces
RB6xx Series	Ether1, Ether2
RB7xx Series	All Ethernet
RB800	ether1, Ether2
RB9xx	All Ethernet
RB1000	All Ethernet
RB1100 Series	Ether1 – Ether10, Ether11
RB2011 Series	All Ethernet, SFP
CCR Series	All Ethernet, SFP
All Devies	Wireless Interface (wireless-fp / wireless-cm) Bridge Interface Bonding Interface (RX ONLY)

**Fastpath bisa berjalan minimal interface source sudah
mensupport**

Handlers

- IPv4
- IPv4 Fasttrack
- Traffic Generator
- MPLS
- Bridge

IPv4 Handler

Tidak boleh mengaktifkan :

IP → Firewall

Queue

Connection Tracking

IP → Hotspot

IP → IPSec → Policies

IP → route → VRF

IP → Accounting

Mesh, Metarouter Interfaces

Tool → MAC-SCAN

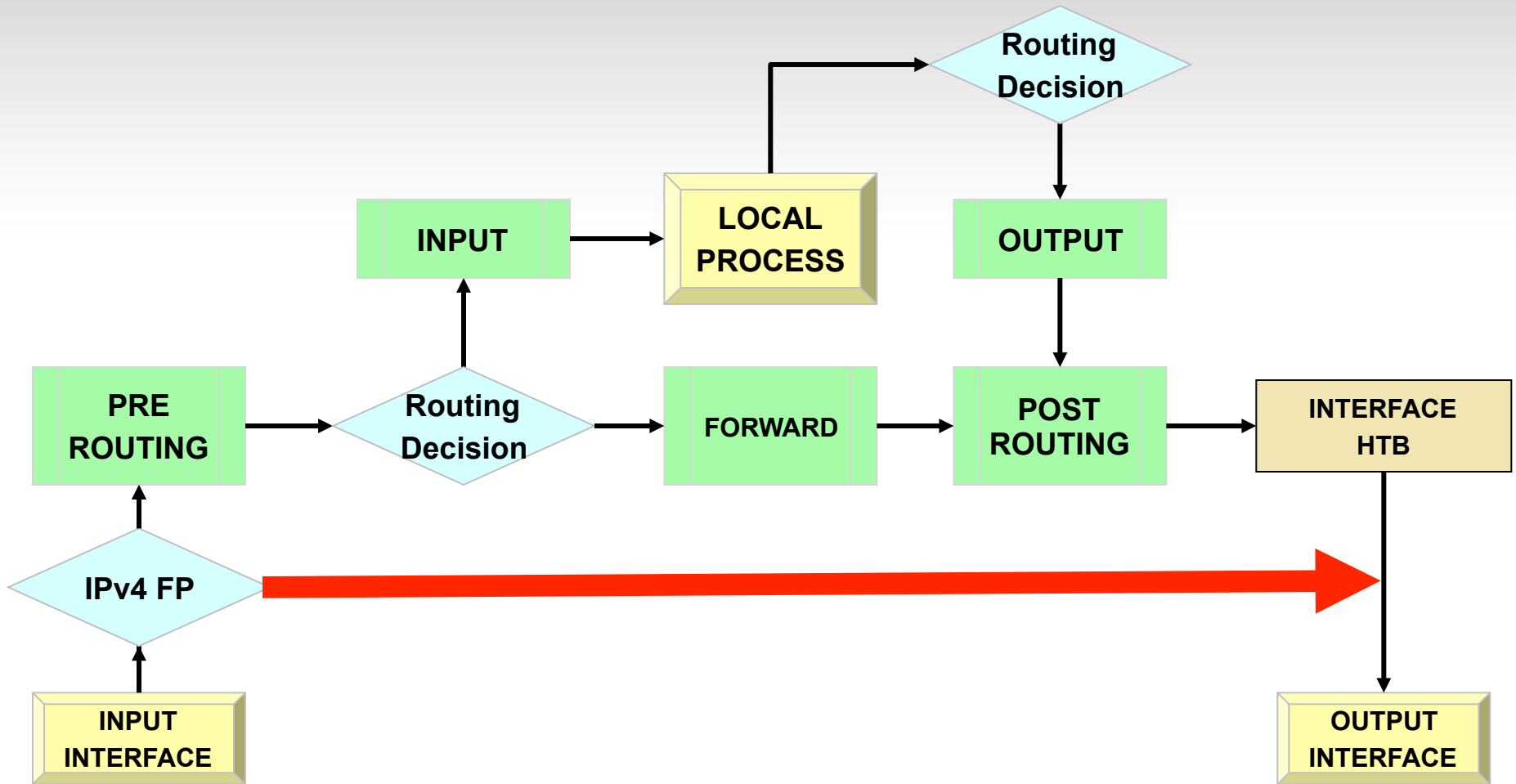
Tool → IPSCAN

Tool → Sniffer

Tool → Torch

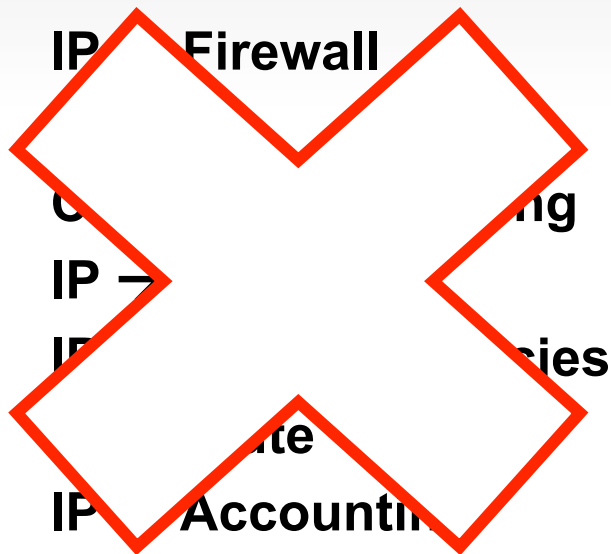
Tool → Traffic Generator

IPv4 Fastpath Flow



IPv4 Fasttrack Handler

Tidak boleh mengaktifkan :



Mesh, Metarouter Interfaces

Tool → MAC-SCAN

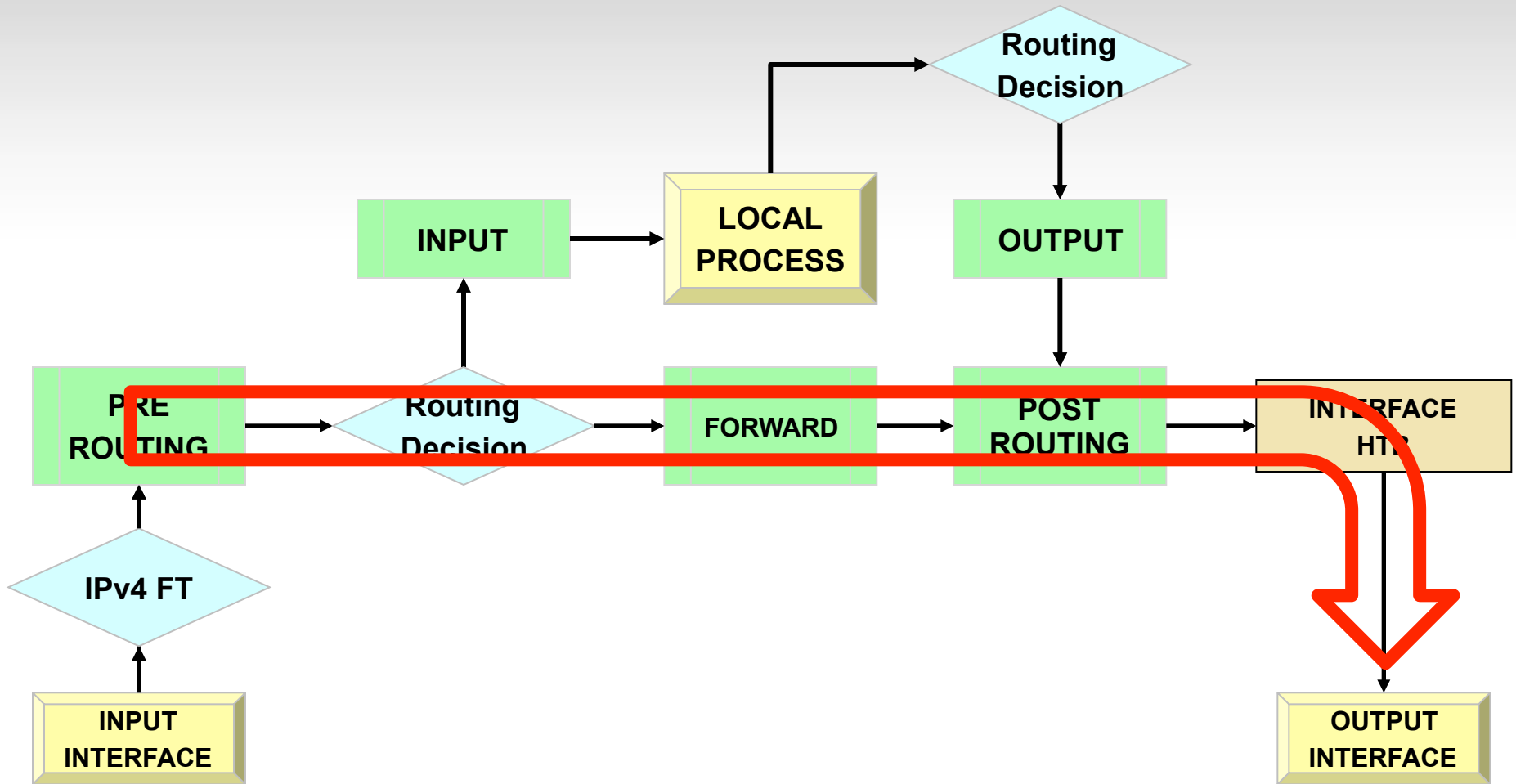
Tool → IPSCAN

Tool → Sniffer

Tool → Torch

Sampai v6.33rc16, baru TCP & UDP

IP Fasttrack Handler Flow



Fasttrack Customise

- Fasttrack tidak hanya sebagai ON-OFF acceleration saja, tetapi tetap bisa kita kustomisasi
- Gunakan firewall matcher untuk mengklasifikasi paket datanya
- Sesuai “pakem”nya, urutan berpengaruh

Fasttrack action

Firewall								
Filter Rules		NAT	Mangle	Service Ports	Connections	Address Lists	Layer7 Protocols	
						Reset Counters	Reset All Counters	Find <input type="text"/> al
#	Action	Chain	Src. Address	Dst. Address	Protocol	Dst. Port		
2	accept	prerouting						
;;; special dummy rule to show fasttrack counters								
3	accept	forward						
;;; special dummy rule to show fasttrack counters								
4	accept	postrouting						
;;; FASTTRACK BOS								
5	fasttrack connection	forward	172.16.1.1		6 (tcp)	443,80		
;;; HTTP all connection								
6	mark connection	forward	172.16.1.0/24		6 (tcp)	80		
7	mark packet	forward						
8	mark connection	forward	172.16.1.0/24		6 (tcp)	443		
9	mark packet	forward						
10	mark connection	forward	172.16.1.0/24		6 (tcp)	20-21		
11	mark packet	forward						
;;; FASTTRACK OB non HTTP								
12	fasttrack connection	forward	172.16.1.69					
13	mark packet	forward	172.16.1.0/24		1 (icmp)			
14	mark packet	forward		172.16.1.0/24	1 (icmp)			

15 items (1 selected)

Bridge Handler

Tidak boleh mengaktifkan :

Bridge → Filter

Bridge → NAT

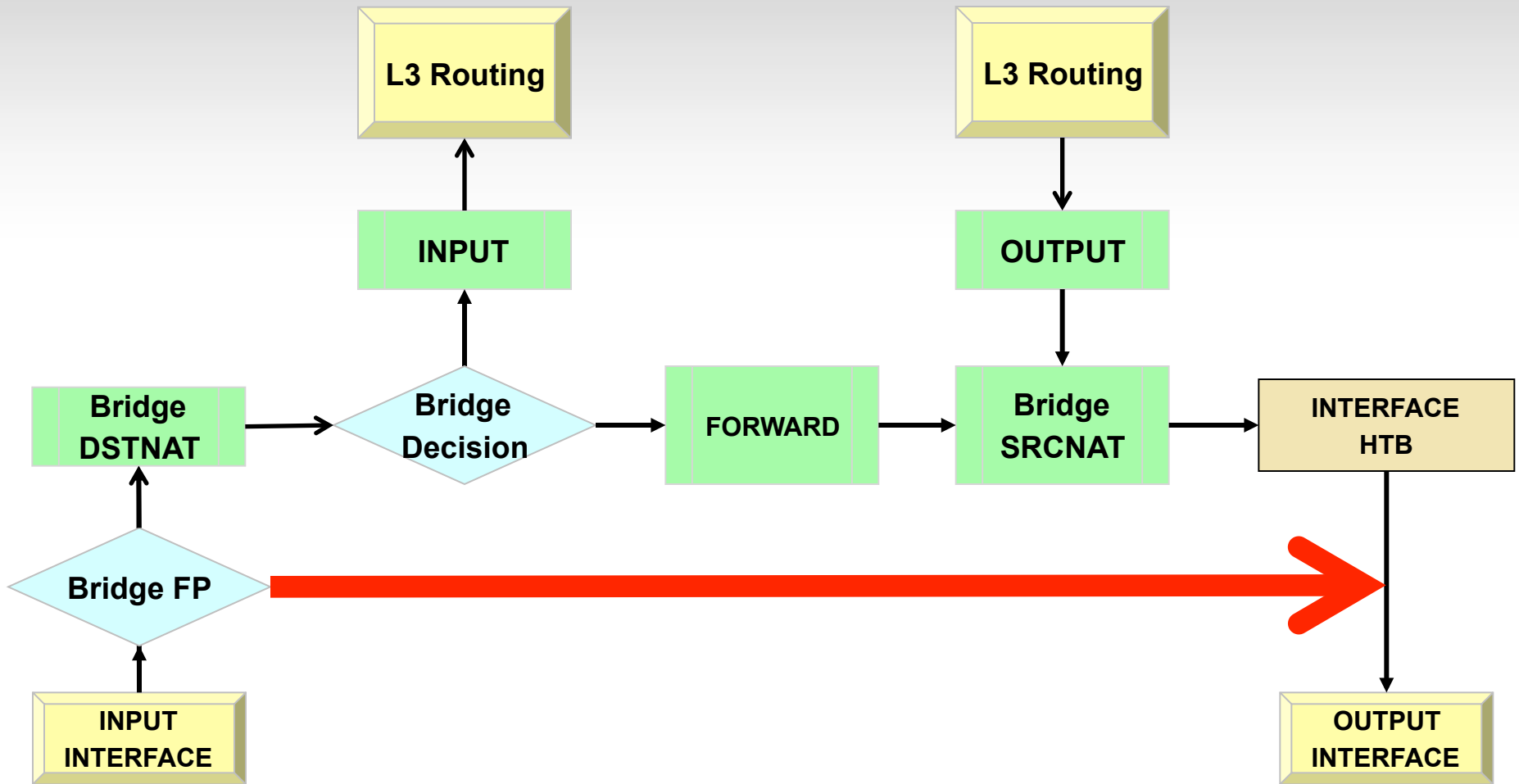
Use IP Firewall

Mesh, Metarouter Interfaces

Tool → Sniffer

Tool → Torch

Bridge Fastpath Flow



Handler Lain

- Traffic Generator & MPLS, Fastpath secara otomatis akan aktif jika interface yang digunakan sudah mendukung
- Khusus MPLS hanya bisa untuk LSR (Paket masuk, ganti label, kirim)

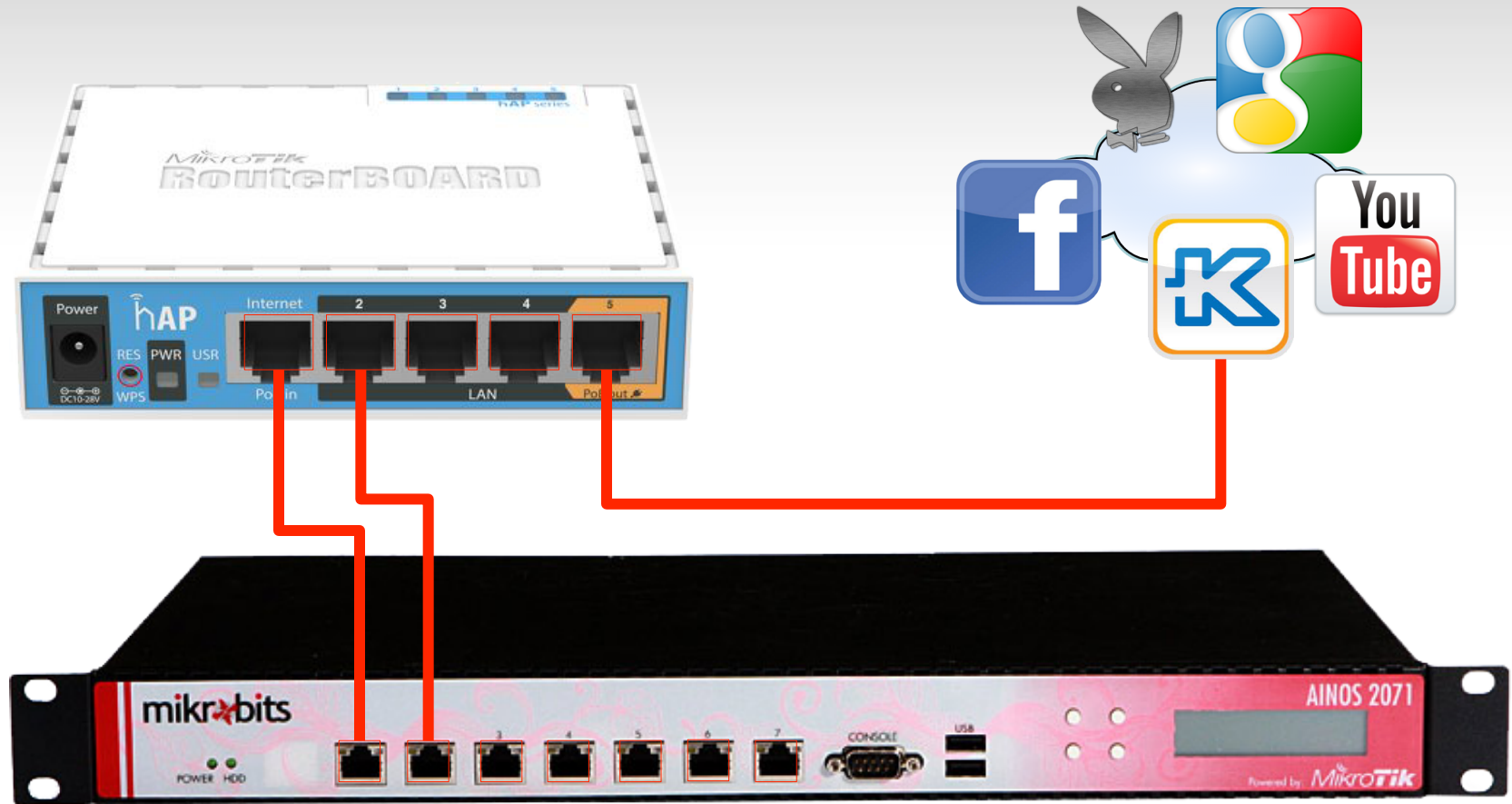
Cepat / Lambat ??

- Latency : lama waktu paket pengiriman
- Jitter : rata-rata perbedaan latency antar paket
- Latency & Jitter merupakan delay dalam sebuah jaringan
- Keduanya bisa disebabkan :
 - Transmisi Delay / Kapasitas Link (ex: fast ethernet, gigabit ethernet, 10g fiber, wlan 802.11 dll)
 - Queueing Delay
 - Processing Delay (firewall, routing process, packet checksum dll)
 - Hukum Fisika --> signal data tidak bisa melebihi kecepatan cahaya

Latency kecil = Good Jitter kecil = Better !!

CPU load kecil = JOSS

Metode Pengetesan



Metode Pengetesan (2)

- Router Generator mensimulasikan 4 Client melakukan upload & download simultan
 - besar packet 64byte
 - 1Mbps@stream
 - Protocol UDP
- hAP menggunakan v6.33rc16

Test 1: Basic Routing

- Fastpath : OFF
- Contract : OFF
- 4 Stream dari ether1 ↔ ether2

Result 1: Basic Routing

Session: 10.10.100.2

Date: Oct/04/2015 Time: 21:16:44 CPU: 18%

Interface List

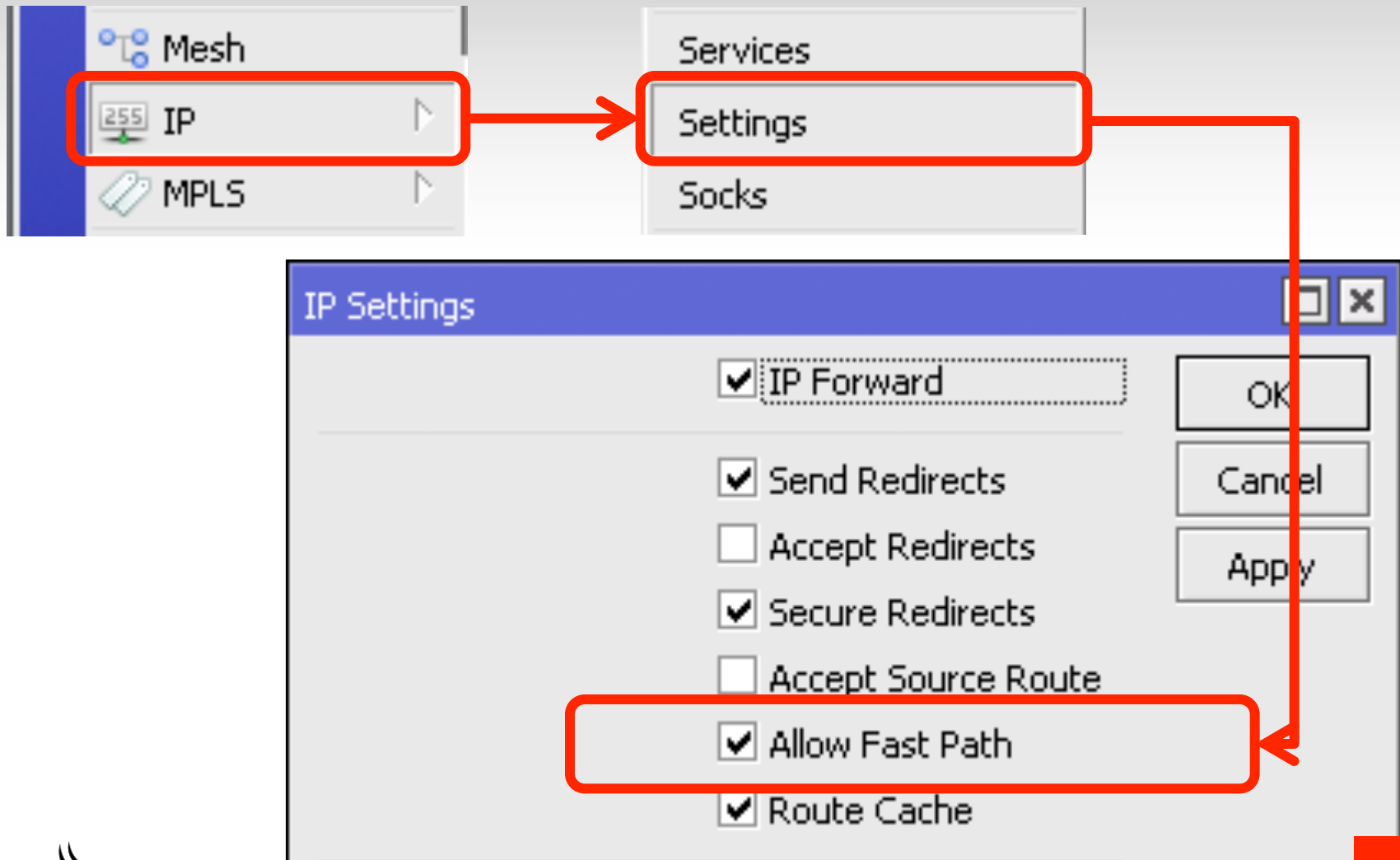
Interface	Ethernet	EoIP Tunnel	IP Tunnel	GRE Tunnel	VLAN
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

CPU Load 16-20%

Name	Tx	Rx	Tx Packe...	Rx Packe...	Tx Drops	Rx Drops	Tx Errors	Rx Errors
R ether1	4.2 Mbps	4.2 Mbps	7 876	7 872	0	0	0	0
R ether2	4.2 Mbps	4.2 Mbps	7 872	7 876	0	0	0	0
R ether3	0 bps	0 bps	0	0	0	0	0	0
R ether4	0 bps	0 bps	0	0	0	0	0	0
R ether5	79.6 kbps	7.1 kbps	9	10	0	0	0	0

Lost Rate	Lat. Min.	Lat. Avg.	Lat. Max.	Jitter
10 bps	34.6us	216us	9.84ms	9.81ms

Test 2 : Basic Routing + FP



Result 2 : Basic Routing + FP

Session: 10.10.100.2

Date: Oct/04/2015 Time: 21:23:18 CPU: 13%

Interface List

Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN VRRP Bonding LTE

Power Cycle

CPU Load 10-15%

	Name	Tx	Rx	Tx Packe...	Rx Packe...	Tx Drops	Rx Drops	Tx Errors	Rx Errors
R	ether1	4.2 Mbps	4.2 Mbps	7 874	7 873	0	0	0	0
R	ether2	4.2 Mbps	4.2 Mbps	7 873	7 874	0	0	0	0
R	ether3	0 bps	0 bps	0	0	0	0	0	0
R	ether4	0 bps	0 bps	0	0	0	0	0	0
R	ether5	67.9 kbps	6.4 kbps	8	9	0	0	0	0

Lost Rate	Lat. Min.	Lat. Avg.	Lat. Max.	Jitter
0 bps	36.4us	216us	7.89ms	7.85ms

Result 2 : Basic Routing + FP

IPv4 Fast Path Active

IPv4 Fast Path Packets: 5 032 801

IPv4 Fast Path Bytes: 307.2 MiB

IPv4 Fasttrack Active

IPv4 Fasttrack Packets: 0

IPv4 Fasttrack Bytes: 0 B

Test 3 : Mangle

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

+ - ✓ ✗ [icon] [icon] Reset Counters 00 Reset All Counters Find all

#	Action	Chain	Src. Address	Dst. Address	In. Int...	Out. I...	Bytes	Packets	Rate	
3	mark packet	forward	172.16.1.4			ether5	0 B	0	0 bps	
;;; up-lan										
4	mark packet	forward	172.16.1.1			!ether5	26.8 MiB	562 674	766.5 kbps	
5	mark packet	forward	172.16.1.2			!ether5	26.8 MiB	562 674	766.9 kbps	
6	mark packet	forward	172.16.1.3			!ether5	26.8 MiB	562 674	767.1 kbps	
7	mark packet	forward	172.16.1.4			!ether5	26.8 MiB	562 672	766.9 kbps	
;;; down-wan										
8	mark packet	forward		172.16.1.1	ether5		0 B	0	0 bps	
9	mark packet	forward		172.16.1.2	ether5		0 B	0	0 bps	
10	mark packet	forward		172.16.1.3	ether5		0 B	0	0 bps	
11	mark packet	forward		172.16.1.4	ether5		0 B	0	0 bps	
;;; down-lan										
12	mark packet	forward		172.16.1.1	!ether5		26.8 MiB	562 672	766.9 kbps	
13	mark packet	forward		172.16.1.2	!ether5		26.8 MiB	562 673	766.9 kbps	
14	mark packet	forward		172.16.1.3	!ether5		26.8 MiB	562 672	766.5 kbps	
15	mark packet	forward		172.16.1.4	!ether5		26.8 MiB	562 674	766.5 kbps	

16 items

Result 3 : Mangle

Session: Date: Time: CPU:

Interface List

Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN

Power Cycle

CPU Load 26-32%

	Name	Tx	Rx	Tx Packe...	Rx Packe...	Tx Drops	Rx Drops	Tx Errors	Rx Errors
R	ether1	4.1 Mbps	4.1 Mbps	7 688	7 686	0	0	0	
R	ether2	4.1 Mbps	4.1 Mbps	7 686	7 688	0	0	0	

Lost Rate	Lat. Min.	Lat. Avg.	Lat. Max.	Jitter
838 bps	48.1us	237us	12.7ms	12.7ms

Result 3 : Mangle

IPv4 Fast Path Active

IPv4 Fast Path Packets: 0

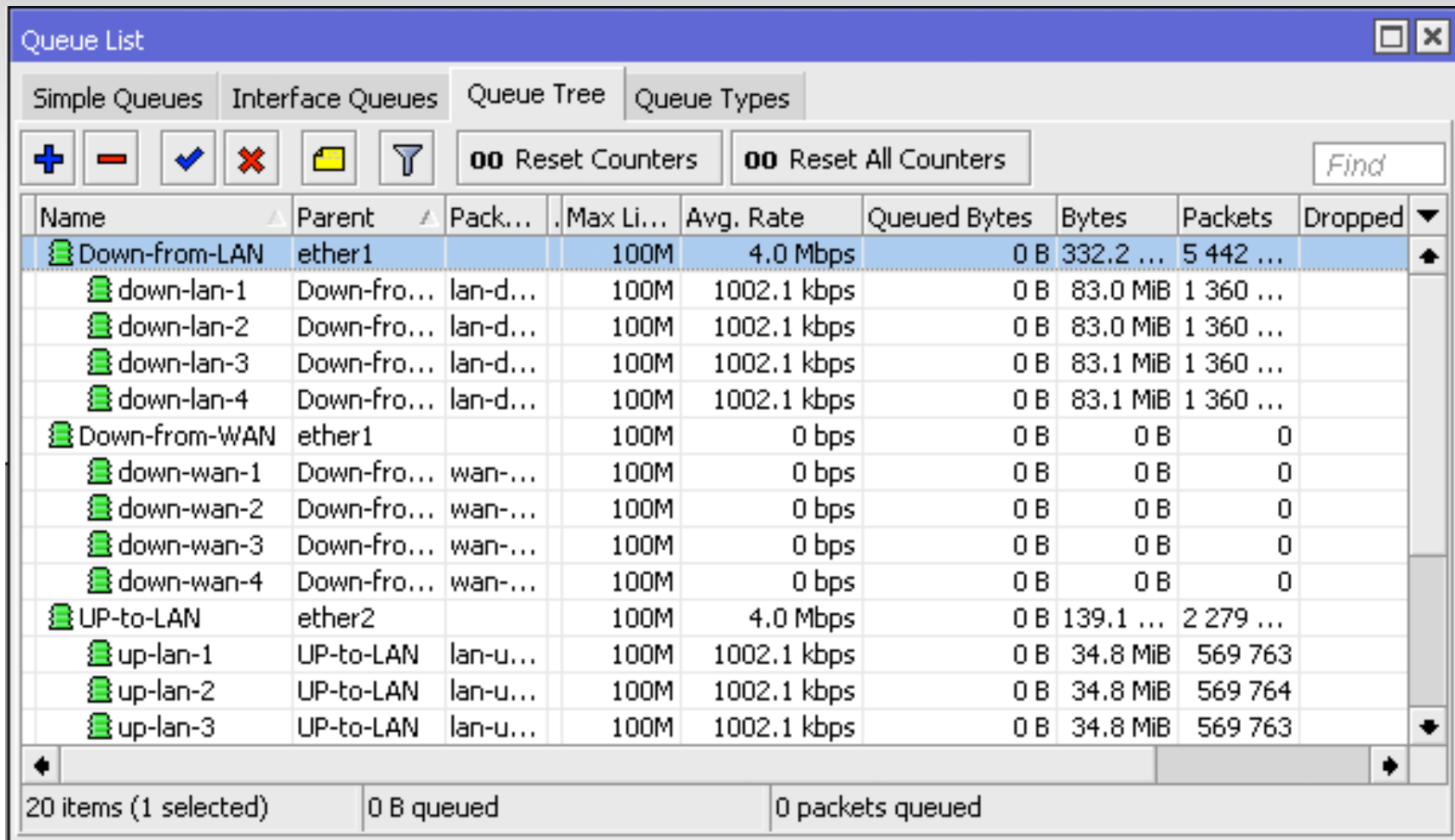
IPv4 Fast Path Bytes: 0 B

IPv4 Fasttrack Active

IPv4 Fasttrack Packets: 0

IPv4 Fasttrack Bytes: 0 B

Result 4 : Queue Aktif



The screenshot shows the Mikrotik Queue List window with the 'Queue Tree' tab selected. The table displays a hierarchy of queues. The 'Down-from-LAN' queue is active, as indicated by the green icon and the '4.0 Mbps' average rate. Its sub-queues, 'down-lan-1' through 'down-lan-4', are also active and show an average rate of 1002.1 kbps. The 'Down-from-WAN' queue and its sub-queues are inactive, showing 0 bps. The 'UP-to-LAN' queue and its sub-queues are also active, showing an average rate of 1002.1 kbps. The status bar at the bottom indicates 20 items (1 selected), 0 B queued, and 0 packets queued.

Name	Parent	Pack...	Max Li...	Avg. Rate	Queued Bytes	Bytes	Packets	Dropped
Down-from-LAN	ether1		100M	4.0 Mbps	0 B	332.2 ...	5 442 ...	
down-lan-1	Down-fro...	lan-d...	100M	1002.1 kbps	0 B	83.0 MiB	1 360 ...	
down-lan-2	Down-fro...	lan-d...	100M	1002.1 kbps	0 B	83.0 MiB	1 360 ...	
down-lan-3	Down-fro...	lan-d...	100M	1002.1 kbps	0 B	83.1 MiB	1 360 ...	
down-lan-4	Down-fro...	lan-d...	100M	1002.1 kbps	0 B	83.1 MiB	1 360 ...	
Down-from-WAN	ether1		100M	0 bps	0 B	0 B	0	
down-wan-1	Down-fro...	wan-...	100M	0 bps	0 B	0 B	0	
down-wan-2	Down-fro...	wan-...	100M	0 bps	0 B	0 B	0	
down-wan-3	Down-fro...	wan-...	100M	0 bps	0 B	0 B	0	
down-wan-4	Down-fro...	wan-...	100M	0 bps	0 B	0 B	0	
UP-to-LAN	ether2		100M	4.0 Mbps	0 B	139.1 ...	2 279 ...	
up-lan-1	UP-to-LAN	lan-u...	100M	1002.1 kbps	0 B	34.8 MiB	569 763	
up-lan-2	UP-to-LAN	lan-u...	100M	1002.1 kbps	0 B	34.8 MiB	569 764	
up-lan-3	UP-to-LAN	lan-u...	100M	1002.1 kbps	0 B	34.8 MiB	569 763	

20 items (1 selected) 0 B queued 0 packets queued

Result 4 : Queue Aktif

Session: 10.10.100.2 Date: Oct/04/2015 Time: 22:06:06 CPU: 51%

Interface List

Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN VPPP Bonding LTE

Power Cycle

CPU Load 48-55%

	Name	Tx	Rx	Tx Packe...	Rx Packe...	Tx Drops	Rx Drops	Tx Errors	Rx Errors
R	ether1	4.2 Mbps	4.2 Mbps	7 876	7 877	0	0	0	
R	ether2	4.2 Mbps	4.2 Mbps	7 875	7 876	0	0	0	

Lost Rate	Lat. Min.	Lat. Avg.	Lat. Max.	Jitter
2.4 kbps	57.5us	267us	12.2ms	12.2ms

Test 5 : Connection Tracking

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

Tracking

	Src. Address	Dst. Address	Protocol	Orig./Repl. Rate	Orig./Repl. Packets	Orig./Repl. Fastl
SAC	172.16.1.3:10003	172.16.2.3:20003	17 (udp)	789.2 kbps/789.2 k...	737 953/738 028	0/0
SAC	172.16.1.1:10001	172.16.2.1:20001	17 (udp)	789.2 kbps/788.8 k...	737 633/737 635	0/0
SAC	172.16.2.4:20004	172.16.1.4:10004	17 (udp)	788.8 kbps/789.2 k...	738 178/738 108	0/0
SAC	172.16.2.2:20002	172.16.1.2:10002	17 (udp)	788.8 kbps/788.8 k...	737 847/737 778	0/0
SAC	172.16.100.2:5...	10.10.100.2:8291	6 (tcp)	3.7 kbps/95.5 kbps	4 782/4 323	0/0

Connection Tracking

Enabled:

Result 5 : Connection Tracking

Session: 10.10.100.2

Date: Oct/04/2015 Time: 22:15:40 CPU: 65%

Interface List

Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN

Power Cycle Find

	Name	Tx	Rx	Tx Packe...	Rx Packe...	Tx Drops	Rx Drops	Tx Errors	Rx Errors
R	ether1	4.1 Mbps	4.1 Mbps	7 686	7 686	0	0	0	0
R	ether2	4.1 Mbps	4.1 Mbps	7 688	7 686	0	0	0	0

CPU Load 60-65%

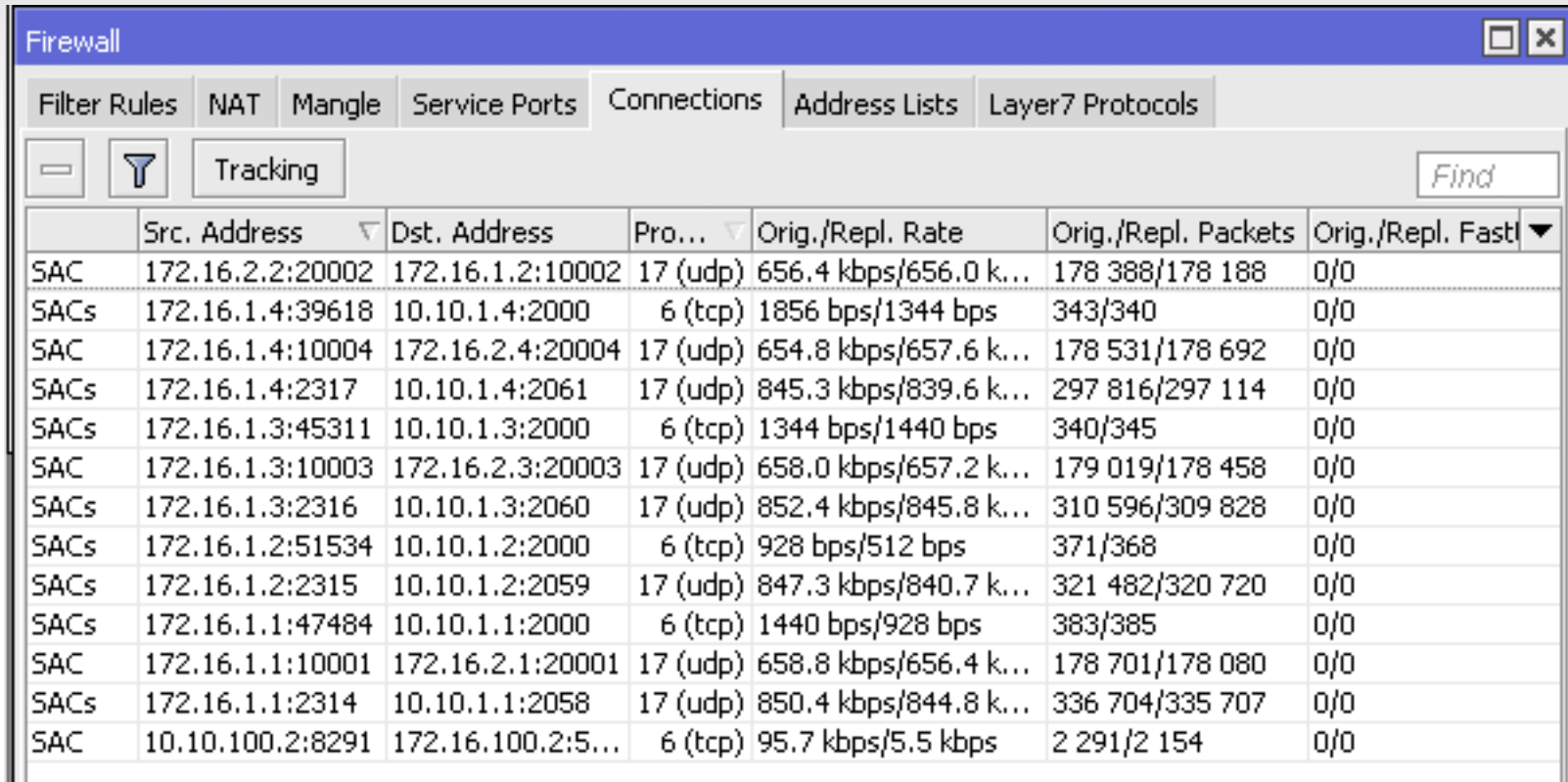
Lost Rate	Lat. Min.	Lat. Avg.	Lat. Max.	Jitter
6.5 kbps	60.3us	308us	12.1ms	12ms

Test 6 : Masquerade

#	Action	Chain	Out. Interface
0	masquerade	srcnat	ether5

```
Terminal
[admin@R2-TGEN] > tool bandwidth-test user=admin \
... direction=both \
... local-udp-tx-size=64 remote-udp-tx-size=64 \
... local-tx-speed=1M remote-tx-speed=1M \
... address=10.10.1.2
      status: running
      duration: 20s
      tx-current: 999.9kbps
tx-10-second-average: 1000.0kbps
      tx-total-average: 1000.0kbps
      rx-current: 999.9kbps
rx-10-second-average: 999.9kbps
      rx-total-average: 996.2kbps
      lost-packets: 0
      random-data: no
      direction: both
      tx-size: 64
      rx-size: 64
-- [Q quit|D dump|C-z pause]
```

Test 6 : Masquerade



The screenshot shows the Mikrotik WinBox Firewall Connections tab. The interface includes a menu bar with 'Filter Rules', 'NAT', 'Mangle', 'Service Ports', 'Connections', 'Address Lists', and 'Layer7 Protocols'. Below the menu bar, there are buttons for 'Tracking' and a 'Find' search box. The main area displays a table of active connections with the following columns: Src. Address, Dst. Address, Proto., Orig./Repl. Rate, Orig./Repl. Packets, and Orig./Repl. Fastl.

	Src. Address	Dst. Address	Proto.	Orig./Repl. Rate	Orig./Repl. Packets	Orig./Repl. Fastl
SAC	172.16.2.2:20002	172.16.1.2:10002	17 (udp)	656.4 kbps/656.0 k...	178 388/178 188	0/0
SACs	172.16.1.4:39618	10.10.1.4:2000	6 (tcp)	1856 bps/1344 bps	343/340	0/0
SAC	172.16.1.4:10004	172.16.2.4:20004	17 (udp)	654.8 kbps/657.6 k...	178 531/178 692	0/0
SACs	172.16.1.4:2317	10.10.1.4:2061	17 (udp)	845.3 kbps/839.6 k...	297 816/297 114	0/0
SACs	172.16.1.3:45311	10.10.1.3:2000	6 (tcp)	1344 bps/1440 bps	340/345	0/0
SAC	172.16.1.3:10003	172.16.2.3:20003	17 (udp)	658.0 kbps/657.2 k...	179 019/178 458	0/0
SACs	172.16.1.3:2316	10.10.1.3:2060	17 (udp)	852.4 kbps/845.8 k...	310 596/309 828	0/0
SACs	172.16.1.2:51534	10.10.1.2:2000	6 (tcp)	928 bps/512 bps	371/368	0/0
SACs	172.16.1.2:2315	10.10.1.2:2059	17 (udp)	847.3 kbps/840.7 k...	321 482/320 720	0/0
SACs	172.16.1.1:47484	10.10.1.1:2000	6 (tcp)	1440 bps/928 bps	383/385	0/0
SAC	172.16.1.1:10001	172.16.2.1:20001	17 (udp)	658.8 kbps/656.4 k...	178 701/178 080	0/0
SACs	172.16.1.1:2314	10.10.1.1:2058	17 (udp)	850.4 kbps/844.8 k...	336 704/335 707	0/0
SAC	10.10.100.2:8291	172.16.100.2:5...	6 (tcp)	95.7 kbps/5.5 kbps	2 291/2 154	0/0

Result 6 : Masquerade

Session: 10.10.100.2 Date: Oct/04/2015 Time: 22:25:50 CPU: 100%

Interface List

Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN

Power Cycle

CPU Load 100%

	Name	Tx	Rx	Tx Packe...	Rx Packe...	Tx Drops	Rx Drops	Tx Errors	Rx Errors
R	ether1	7.8 Mbps	9.4 Mbps	13 094	15 759	0	0	0	0
R	ether2	3.5 Mbps	4.2 Mbps	6 562	7 876	0	0	0	0
R	ether3	0 bps	0 bps	0	0	0	0	0	0
R	ether4	0 bps	0 bps	0	0	0	0	0	0
R	ether5	4.4 Mbps	5.1 Mbps	6 601	7 898	0	0	0	0

Lost Rate	Lat. Min.	Lat. Avg.	Lat. Max.	Jitter
1329.8...	70.6us	1.85ms	20.7ms	20.7ms

Test 7 : Fasttrack

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

+ - ✓ ✗ 📄 ⚙️ Reset Counters 00 Reset All Counters Find

#	Action	Chain	In. Interface	Out. Interface	Bytes	Packets
;;; special dummy rule to show fasttrack counters						
0 D	✓ accept	forward			0 B	0
1	▶▶ fasttrack connection	forward	!ether5	!ether5	0 B	0
2	✓ accept	forward	!ether5	!ether5	0 B	0

Result 7 : Fasttrack

#	Action	Chain	Src. Address	Dst. Address	In. Int...	Out. I...	Bytes	Packets	Rate
;;; special dummy rule to show fasttrack counters									
0	✓ accept	prero...					302.2 MiB	4 951 681	7.7 Mbps
;;; special dummy rule to show fasttrack counters									
1	✓ accept	forward					302.2 MiB	4 951 681	7.7 Mbps
;;; special dummy rule to show fasttrack counters									
2	✓ accept	postr...					302.2 MiB	4 951 681	7.7 Mbps
;;; up-wan									
3	✂ mark packet	forward	172.16.1.1			ether5	39.0 MiB	638 614	1015.4 kbps
4	✂ mark packet	forward	172.16.1.2			ether5	39.0 MiB	638 615	1015.7 kbps
5	✂ mark packet	forward	172.16.1.3			ether5	39.0 MiB	638 657	1015.9 kbps
6	✂ mark packet	forward	172.16.1.4			ether5	39.0 MiB	638 715	1016.6 kbps
;;; up-lan									
7	✂ mark packet	forward	172.16.1.1			!ether5	400 B	8	194 bps
8	✂ mark packet	forward	172.16.1.2			!ether5	350 B	7	0 bps
9	✂ mark packet	forward	172.16.1.3			!ether5	350 B	7	0 bps
10	✂ mark packet	forward	172.16.1.4			!ether5	350 B	7	0 bps
;;; down-wan									

19 items (1 selected)

Result 7 : Fasttrack

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

Tracking Find

	Src. Address	Dst. Address	Pro...	Orig./Repl. Rate	Orig./Repl. Packets	Orig./Repl. Fast
SAC	172.16.100.2:5...	10.10.100.2:8291	6 (tcp)	5.1 kbps/69.1 kbps	8 124/8 236	0/0
SACs	172.16.1.4:39626	10.10.1.4:2000	6 (tcp)	1536 bps/1024 bps	1 256/953	0/0
SACF	172.16.1.4:10004	172.16.2.4:20004	17 (udp)	1006.0 kbps/1006....	1 126 654/1 126 ...	1 126 639/1 126 ...
SACs	172.16.1.4:2325	10.10.1.4:2069	17 (udp)	1005.0 kbps/1004....	1 211 744/1 211 ...	0/0
SACs	172.16.1.3:45319	10.10.1.3:2000	6 (tcp)	1344 bps/1440 bps	1 269/1 270	0/0
SACF	172.16.1.3:10003	172.16.2.3:20003	17 (udp)	1004.5 kbps/1005....	1 126 412/1 126 ...	1 126 397/1 126 ...
SACs	172.16.1.3:2324	10.10.1.3:2068	17 (udp)	1006.0 kbps/1004....	1 226 416/1 226 ...	0/0
SACs	172.16.1.2:51542	10.10.1.2:2000	6 (tcp)	1344 bps/1440 bps	1 281/1 282	0/0
SACF	172.16.1.2					
SACs	172.16.1.2					
SACs	172.16.1.1					
SACF	172.16.1.1					
SACs	172.16.1.1					
C	10.10.100					
C	10.10.100					

15 items

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

+ - ✓ ✗ [icon] [icon] Reset Counters 00 Reset All Counters Find

#	Action	Chain	In. Interface	Out. Interface	Bytes	Packets
;;; special dummy rule to show fasttrack counters						
0 D	✓ accept	forward			279.1 MiB	4 572 543
1	▶▶ fasttrack connection	forward	!ether5	!ether5	2000 B	40
2	✓ accept	forward	!ether5	!ether5	2000 B	40

Result 7 : Fasttrack

IPv4 Fast Path Active

IPv4 Fast Path Packets: 0

IPv4 Fast Path Bytes: 0 B

IPv4 Fasttrack Active

IPv4 Fasttrack Packets: 11 179 268

IPv4 Fasttrack Bytes: 682.3 MiB

Result 7 : Fasttrack

Session: 10.10.100.2

Date: Oct/04/2015 Time: 22:45:26 CPU: 82%

Interface List

Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLA

✓ ✕ [] [] Power Cycle Find

	Name	Tx	Rx	Tx Packe...	Rx Packe...	Tx Drops	Rx Drops	Tx Errors	Rx Errors
R	ether1	9.1 Mbps	9.2 Mbps	15 273	15 384	0	0	0	
R	ether2	4.1 Mbps	4.1 Mbps	7 633	7 686	0	0	0	
R	ether3	0 bps	0 bps	0	0	0	0	0	
R	ether4	0 bps	0 bps	0	0	0	0	0	
R	ether5	5.0 Mbps	5.0 Mbps	7 649	7 704	0	0	0	

CPU Load 80-85%

Lost Rate	Lat. Min.	Lat. Avg.	Lat. Max.	Jitter
44.0 kbps	36.9us	362us	18.7ms	18.7ms

Test 8 : WAN Only - Fasttrack

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

+ - ✓ ✗ [icon] [icon] Reset Counters 00 Reset All Counters Find all [dropdown]

#	Action	Chain	Src. Address	Dst. Address	In. Int...	Out. I...	Bytes	Packets	Rate	
;;; up-wan										
0	✂ mark packet	forward	172.16.1.1			ether5	42.8 MiB	702 062	1021.8 kbps	
1	✂ mark packet	forward	172.16.1.2			ether5	44.3 MiB	726 583	1021.6 kbps	
2	✂ mark packet	forward	172.16.1.3			ether5	44.1 MiB	722 879	1020.8 kbps	
3	✂ mark packet	forward	172.16.1.4			ether5	43.9 MiB	719 065	1021.8 kbps	
;;; down-wan										
4	✂ mark packet	forward		172.16.1.1	ether5		42.8 MiB	701 870	1021.6 kbps	
5	✂ mark packet	forward		172.16.1.2	ether5		44.3 MiB	726 406	1021.8 kbps	
6	✂ mark packet	forward		172.16.1.3	ether5		44.1 MiB	722 684	1021.8 kbps	
7	✂ mark packet	forward		172.16.1.4	ether5		43.9 MiB	718 894	1021.6 kbps	

Result 8 : WAN Only - Fasttrack

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

Tracking Find

	Src. Address ▾	Dst. Address	Pro... ▾	Orig./Repl. Rate	Orig./Repl. Packets	Orig./Repl. Fastl ▾
SAC	172.16.100.2:5...	10.10.100.2:8291	6 (tcp)	5.1 kbps/70.9 kbps	5 084/4 940	0/0
SACs	172.16.1.4:39629	10.10.1.4:2000	6 (tcp)	1440 bps/1344 bps	789/787	0/0
SAC	172.16.1.4:10004	172.16.2.4:20004	17 (udp)	782.4 kbps/782.8 k...	718 314/718 341	0/0
SACs	172.16.1.4:2328	10.10.1.4:2072	17 (udp)	1003.0 kbps/1001....	759 450/759 242	0/0
SACs	172.16.1.3:45322	10.10.1.3:2000	6 (tcp)	1344 bps/1440 bps	793/792	0/0
SAC	172.16.1.3:10003	172.16.2.3:20003	17 (udp)	782.4 kbps/782.4 k...	718 339/718 383	0/0
SACs	172.16.1.3:2327	10.10.1.3:2071	17 (udp)	1003.0 kbps/1001....	763 255/763 022	0/0
SACs	172.16.1.2:51545	10.10.1.2:2000	6 (tcp)	1344 bps/1344 bps	797/791	0/0
SAC	172.16.1.2:10002	172.16.2.2:20002	17 (udp)	782.4 kbps/782.0 k...	718 312/718 305	0/0
SACs	172.16.1.2:2326	10.10.1.2:2070	17 (udp)	1001.9 kbps/1000....	766 949/766 741	0/0
SACs	172.16.1.1:47499	10.10.1.1:2000	6 (tcp)	1440 bps/1344 bps	771/769	0/0
SAC	172.16.1.1:10001	172.16.2.1:20001	17 (udp)	782.4 kbps/782.4 k...	718 316/718 310	0/0
SACs	172.16.1.1:2329	10.10.1.1:2073	17 (udp)	1003.0 kbps/1004....	742 467/742 244	0/0

Result 8 : WAN Only - Fasttrack

Session: 10.10.100.2

Date: Oct/04/2015 Time: 22:56:57 CPU: 93%

Interface List

Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLA

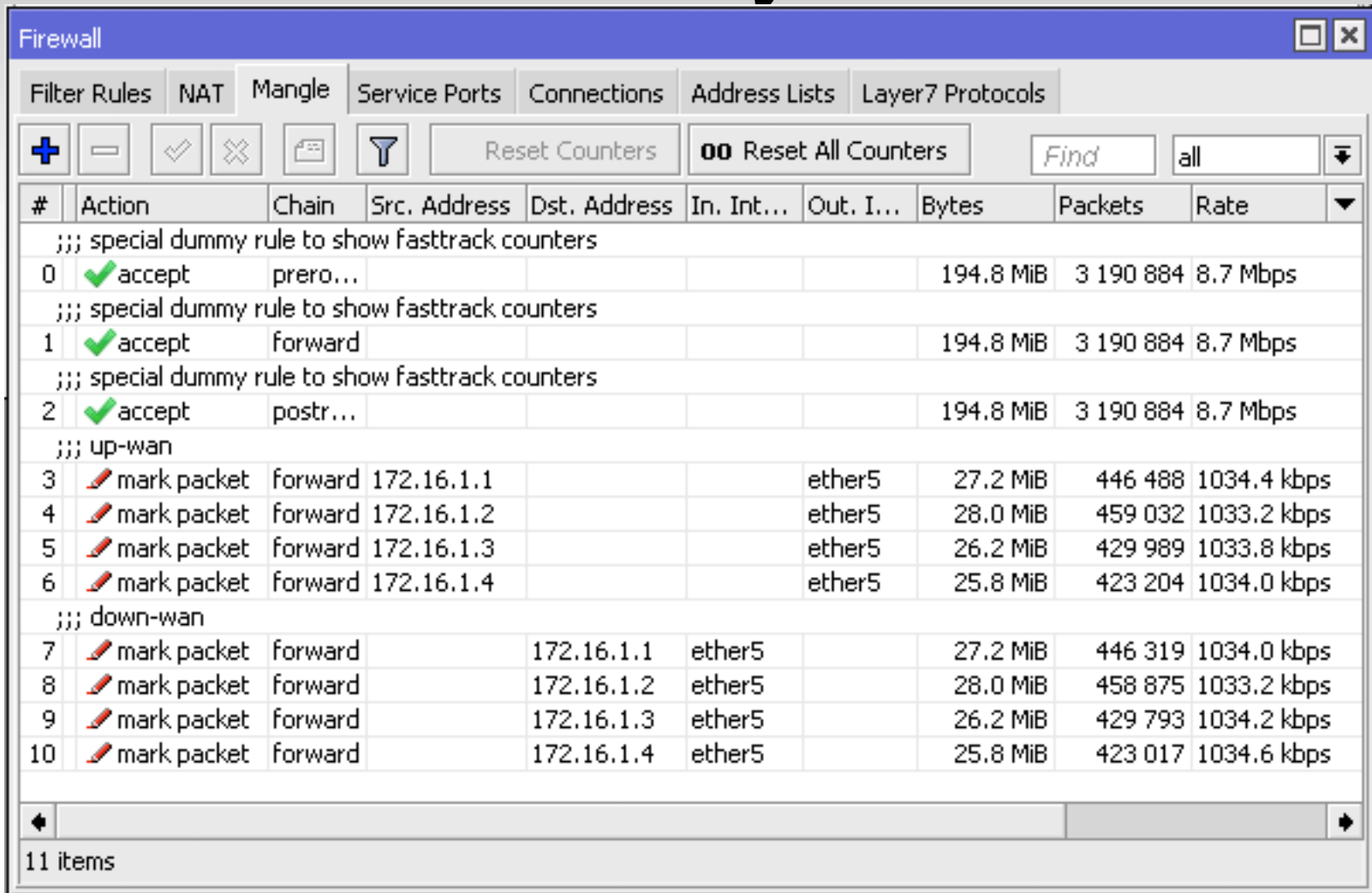
Power Cycle

CPU Load 90-95%

	Name	Tx	Rx	Tx Packe...	Rx Packe...	Tx Drops	Rx Drops	Tx Errors	Rx Errors
R	ether1	9.3 Mbps	9.4 Mbps	15 656	15 765	0	0	0	
R	ether2	4.2 Mbps	4.2 Mbps	7 830	7 880	0	0	0	
R	ether3	0 bps	0 bps	0	0	0	0	0	
R	ether4	0 bps	0 bps	0	0	0	0	0	
R	ether5	5.2 Mbps	5.1 Mbps	7 850	7 893	0	0	0	

Lost Rate	Lat. Min.	Lat. Avg.	Lat. Max.	Jitter
60.3 kbps	49.6us	389us	14.2ms	14.2ms

Test 9 : WAN Only + Fasttrack



The screenshot shows the Mikrotik WinBox Firewall configuration window. The 'Filter Rules' tab is active, displaying a list of 11 items. The table below shows the details of these rules, including their actions, chains, source and destination addresses, interfaces, and traffic statistics.

#	Action	Chain	Src. Address	Dst. Address	In. Int...	Out. I...	Bytes	Packets	Rate	
;;; special dummy rule to show fasttrack counters										
0	✓ accept	prero...					194.8 MiB	3 190 884	8.7 Mbps	
;;; special dummy rule to show fasttrack counters										
1	✓ accept	forward					194.8 MiB	3 190 884	8.7 Mbps	
;;; special dummy rule to show fasttrack counters										
2	✓ accept	postr...					194.8 MiB	3 190 884	8.7 Mbps	
;;; up-wan										
3	✂ mark packet	forward	172.16.1.1			ether5	27.2 MiB	446 488	1034.4 kbps	
4	✂ mark packet	forward	172.16.1.2			ether5	28.0 MiB	459 032	1033.2 kbps	
5	✂ mark packet	forward	172.16.1.3			ether5	26.2 MiB	429 989	1033.8 kbps	
6	✂ mark packet	forward	172.16.1.4			ether5	25.8 MiB	423 204	1034.0 kbps	
;;; down-wan										
7	✂ mark packet	forward		172.16.1.1	ether5		27.2 MiB	446 319	1034.0 kbps	
8	✂ mark packet	forward		172.16.1.2	ether5		28.0 MiB	458 875	1033.2 kbps	
9	✂ mark packet	forward		172.16.1.3	ether5		26.2 MiB	429 793	1034.2 kbps	
10	✂ mark packet	forward		172.16.1.4	ether5		25.8 MiB	423 017	1034.6 kbps	

11 items

Result 9 : WAN Only + Fasttrack

Session: 10.10.100.2 Date: Oct/04/2015 Time: 23:03:18 CPU: 81%

Interface List

Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN VRRP Bonding LTE

Power Cycle Find

Name	Tx	Rx	Tx Packe...	Rx Packe...	Tx Drops	Rx Drops	Tx Errors	Rx Errors
R ether1	9.0 Mbps	9.2 Mbps	15 128	15 380	0	0	0	
R ether2	4.1 Mbps	4.1 Mbps	7 561	7 688	0	0	0	
R ether3	0 bps	0 bps	0	0	0	0	0	
R ether4	0 bps	0 bps	0	0	0	0	0	
R ether5	5.1 Mbps	5.0 Mbps	7 592	7 707	0	0	0	

Lost Rate	Lat. Min.	Lat. Avg.	Lat. Max.	Jitter
38.3 kbps	38us	377us	13.3ms	13.3ms

Matur Suwun mas dab!
Terima Kasih mas bro!



Dijinkan menggunakan sebagian atau seluruh materi pada modul ini, baik berupa ide, foto, tulisan, konfigurasi dan diagram selama untuk kepentingan pengajaran, dan memberikan kredit kepada penulis serta link ke www.mikrotik.co.id