



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

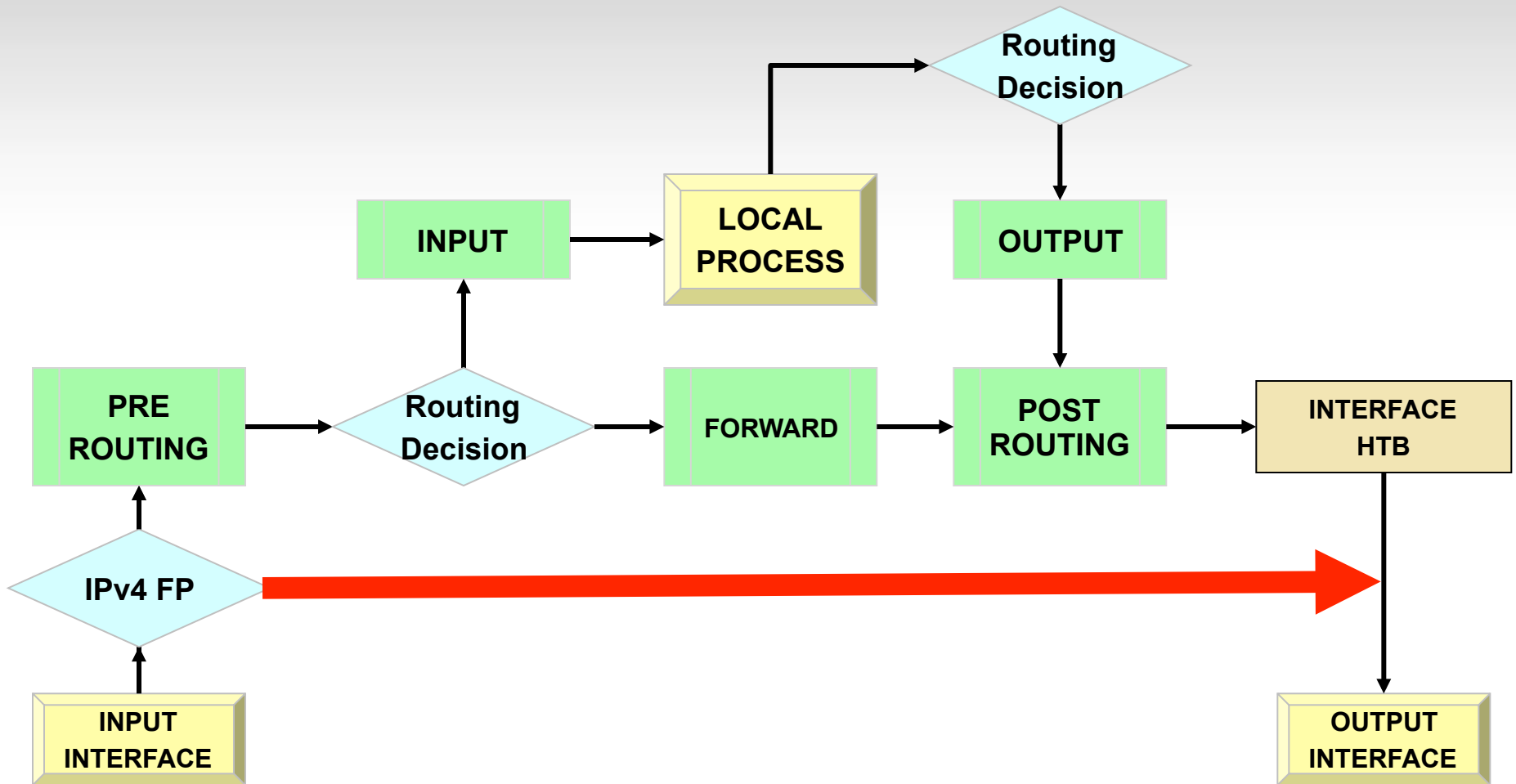
Tool → IPSCAN

Tool → Sniffer

Tool → Torch

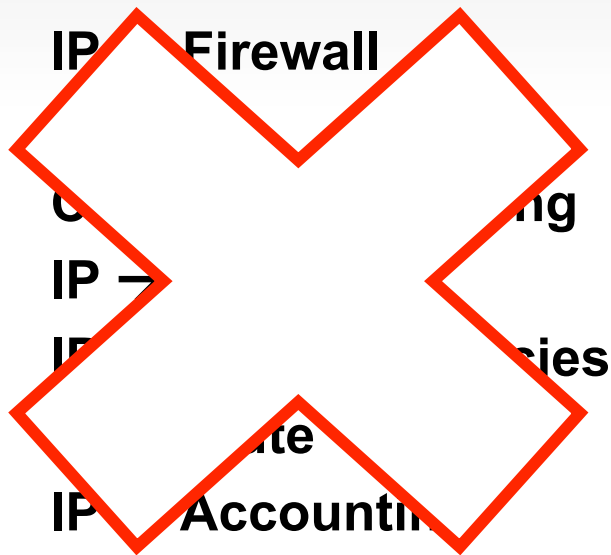
Tool → Traffic Generator

IPv4 Fastpath Flow



IPv4 Fasttrack Handler

Tidak boleh mengaktifkan :



Mesh, Metarouter Interfaces

Tool → MAC-SCAN

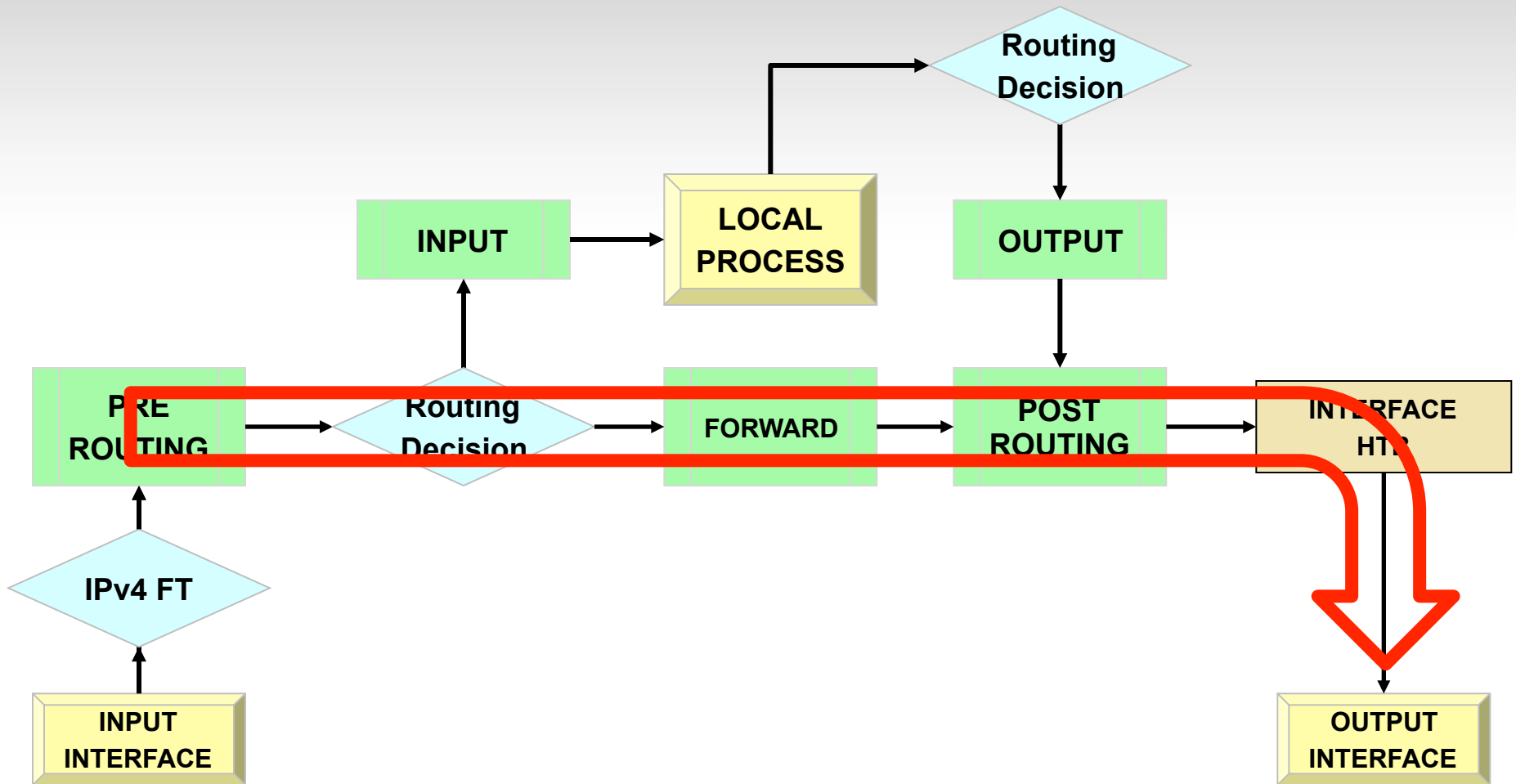
Tool → IPSCAN

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 RulesNATMangleService PortsConnectionsAddress ListsLayer7 Protocols

<

Bridge Handler

Tidak boleh mengaktifkan :

Bridge → Filter

Bridge → NAT

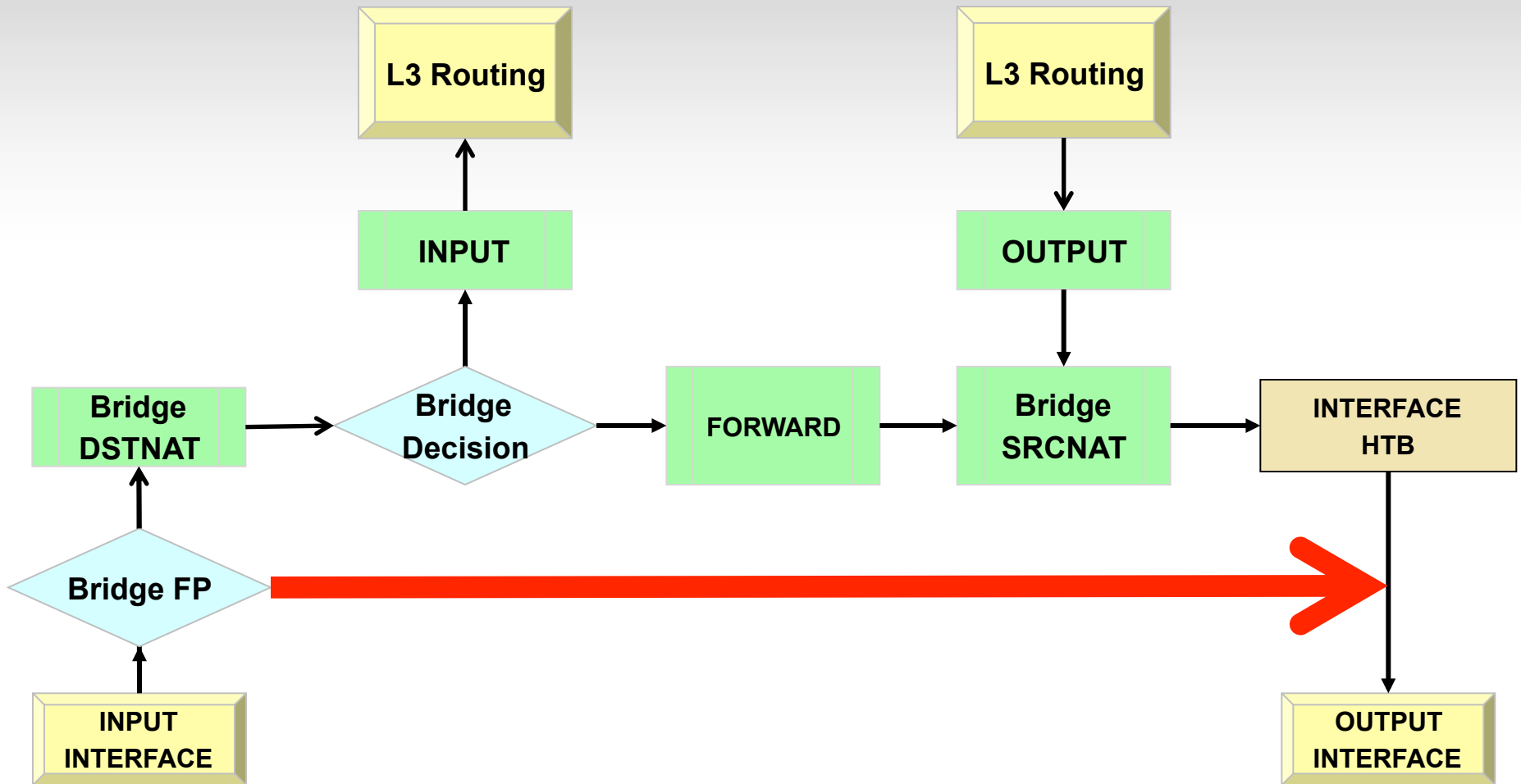
Use IP Firewall

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)

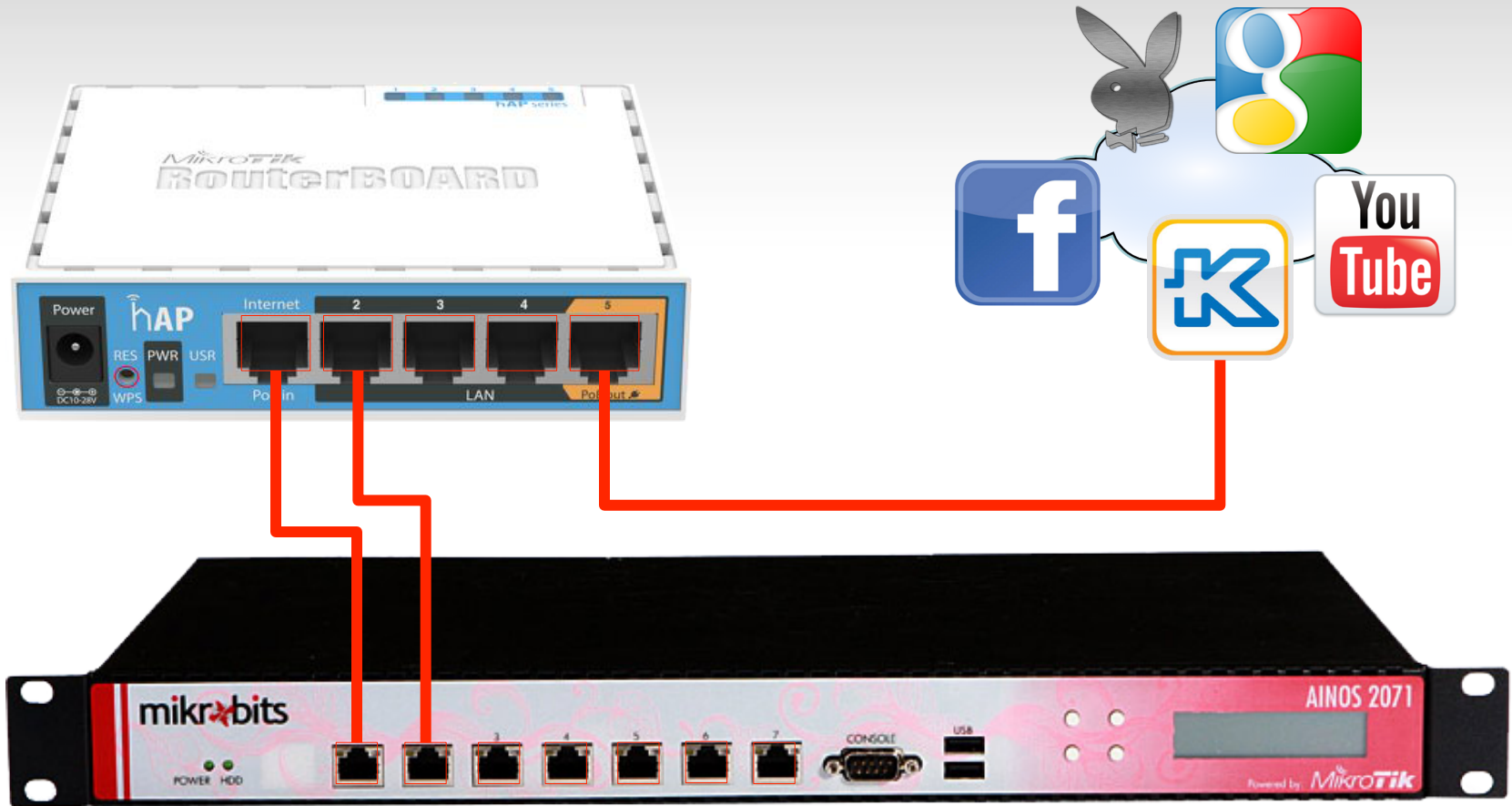
Cepat / Lambat ??

- 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

11555

2

1



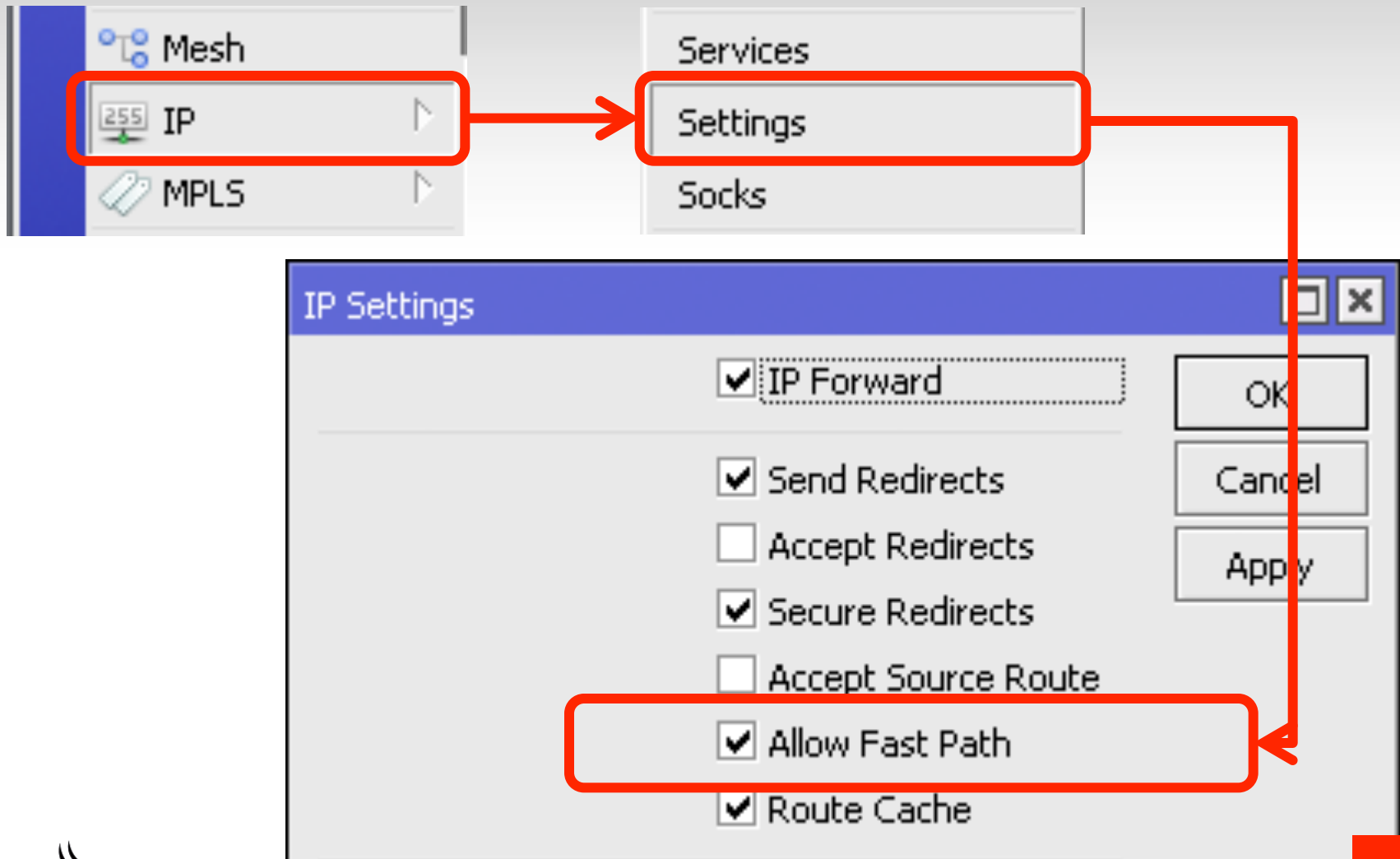
Power Cycle

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	
R	ether2	4.2 Mbps	4.2 Mbps	7 872	7 876	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	79.6 kbps	7.1 kbps	9	10	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	
R	ether2	4.2 Mbps	4.2 Mbps	7 873	7 874	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	67.9 kbps	6.4 kbps	8	9	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										
+ - ✓ ✗ 📄 🔍 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: 10.10.100.2 Date: Oct/04/2015 Time: 21:36:12 CPU: 30%

Interface List

Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN

✓ ✕ [Icon] [Icon] 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

Queue List									
Simple Queues Interface Queues Queue Tree Queue Types									
+ - ✓ ✗ 📁 🔍 00 Reset Counters 00 Reset All Counters Find									
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 VRRP Bonding LTE

✓ ✗ 📄 🔍 Power Cycle

	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	

CPU Load 48-55%

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

	Src. Address	Dst. Address	Protocol	Orig./Repl. Rate	Orig./Repl. Packets	Orig./Repl. Fast
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

✓ ✗ [Icon] [Icon] 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	
R	ether2	4.1 Mbps	4.1 Mbps	7 688	7 686	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

Firewall							
Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols							
							Find
	Src. Address ▾	Dst. Address	Pro... ▾	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

✓ ✕ [Icon] 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	
R	ether2	3.5 Mbps	4.2 Mbps	6 562	7 876	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	4.4 Mbps	5.1 Mbps	6 601	7 898	0	0	0	

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

Result 7 : Fasttrack

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	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

[-]

[Filter Icon]

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

[+]

[-]

[Check]

[X]

[Doc]

[Filter 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

✓ ✕ [Icon] [Icon] Power Cycle Find

CPU Load 80-85%

	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	

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						
						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/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

Firewall										
Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols										
Reset Counters 00 Reset All Counters Find all										
#	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								
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