Le bonding avec Mikrotik

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MUM Paris 2016

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Wifispares/Atlanteam

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- Spécialiste Mikrotik
- Conseils dans le choix des modèles
- Paramétrage sur mesure
- Formation

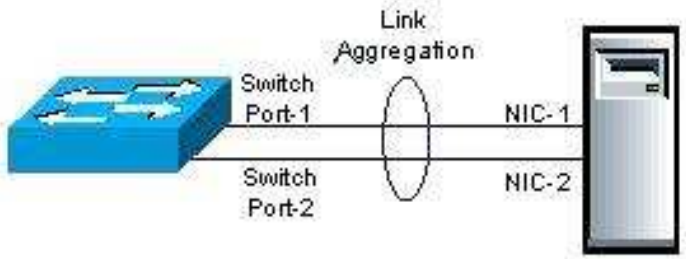
www.atlanteam.com

- Ingénierie réseau
- Solution hotspot propriétaire
- Liaisons point-à-point
- Géolocalisation
  Détection de présence

Table des matières

Le bonding

- En Anglais : coller, assembler
- Groupement de ports physiques en un seul lien logique



Source : wikipedia

➡ Répartition de charge → débit++ !

➡ Redondance → fiabilité++ !

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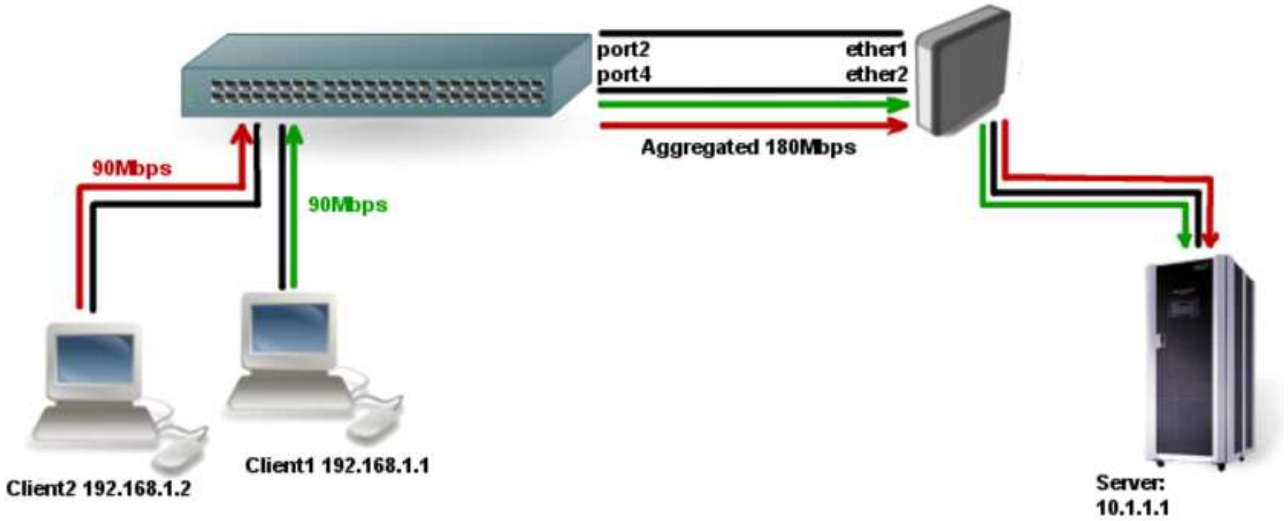
Le bonding / LACP

Standard IEEE 802.3ad



Source : wiki Mikrotik

- Intéropérabilité avec d'autres constructeurs
- Les flux réseaux sont déterminés par un hash MAC
- Conçu pour des interfaces ethernet
- Détection de panne basée sur l'état de l'interface réseau

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Le bonding / autres modes

- Balance XOR
  - Similaire à LACP mais non standard
  - Le hash prend en compte MAC/IP/Port
- Balance TLB
  - Transmit Load Balancing
  - Equilibrage des trames émises
- Balance ALB
  - Adaptive Load Balancing
  - Equilibrage des trames émises ET reçues

Le bonding / autres modes

- Broadcast
  - Les mêmes informations sont envoyées sur tous les liens
  - Pas de répartition de charge
- Active-backup
  - Un seul lien est réellement utilisé, l'autre est en attente
- Balance RR
  - Round Robin (Tourniquet)
  - C'est le seul mode permettant une répartition de charge par paquet !
  - Attention aux paquets qui arrivent *éventuellement* dans le désordre

Tolérance aux pannes

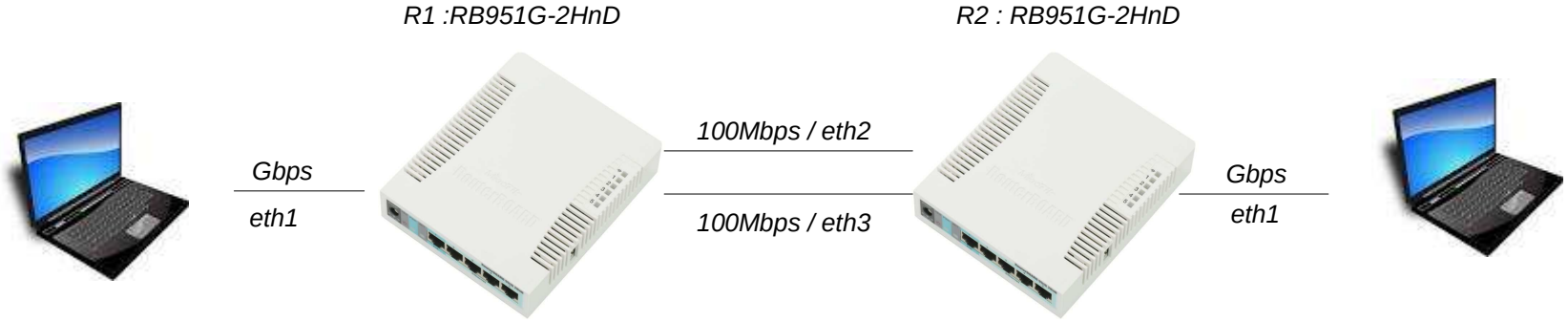
- Détecter le lien défaillant et agir
- MII
  - Basé sur l'état de l'interface
  - Lien ethernet actif = pas de panne
- ARP
  - Basé sur la réponse à des requêtes ARP
  - Plus fiable que MII
- Attention aux mélanges
  - Ex:Pas de ARP avec LACP

Mise en pratique #1

Liaison ethernet

Mise en pratique #1 : ethernet

Vue globale



Liaison entre R1 et R2 volontairement bridée

Mise en pratique #1 : ethernet

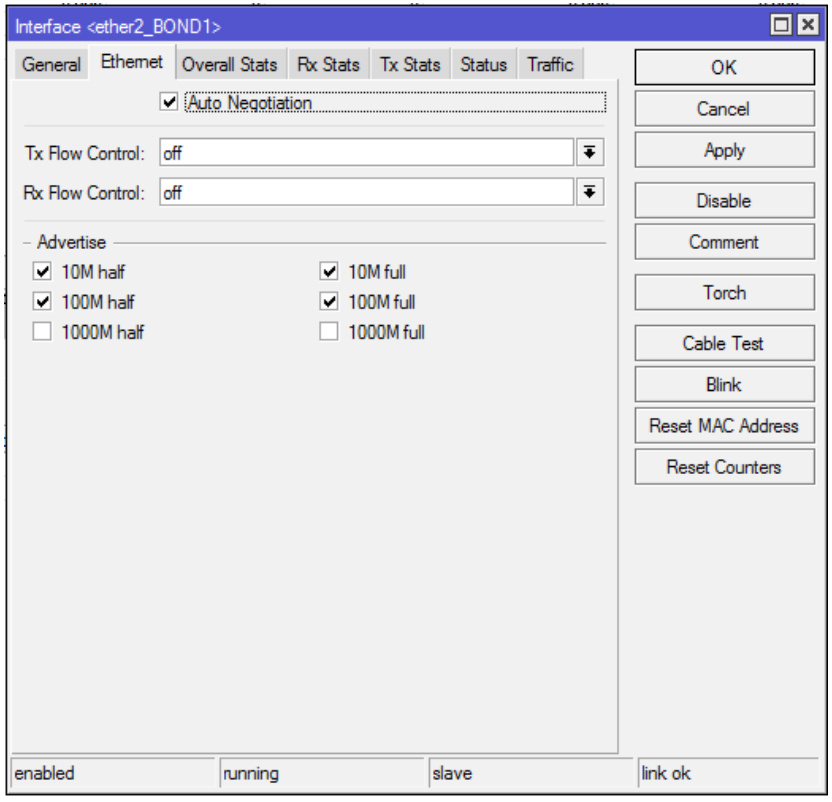
Configuration : interfaces ethernet

/interface ethernet

set [find default-name=ether1] name=ether1_PC

set [find default-name=ether2] name=ether2_BOND1
advertise=10M-half,10M-full,100M-half,100M-full

set [find default-name=ether3] name=ether3_BOND2
advertise=10M-half,10M-full,100M-half,100M-full



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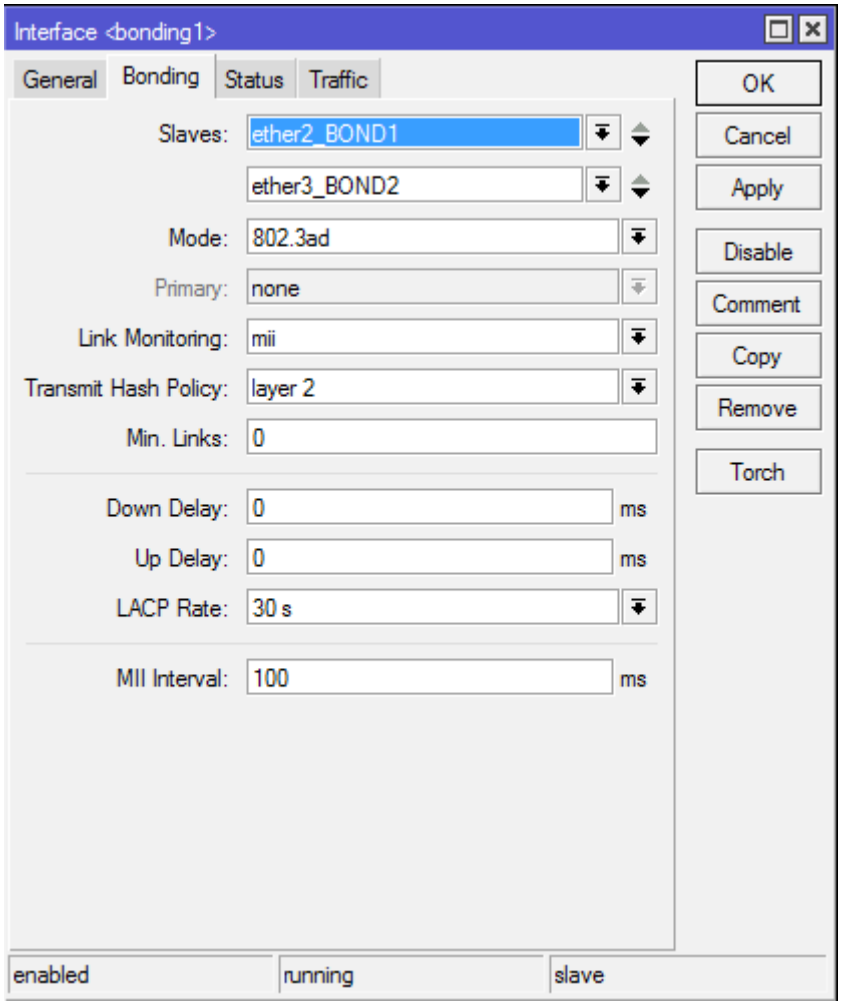
Mise en pratique #1 : ethernet

Configuration : bonding

```
/interface bonding
add mode=802.3ad name=bonding1
slaves=ether2_BOND1,ether3_BOND2
```

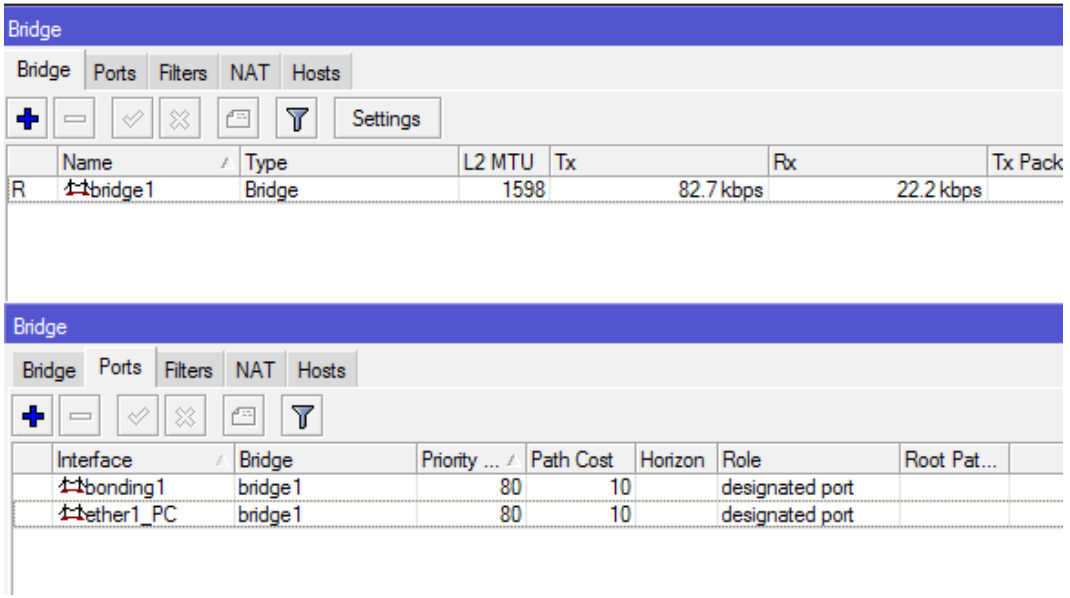


Mise en pratique #1 : ethernet

Configuration : bridge

```
/interface bridge
add name=bridge1

/interface bridge port
add bridge=bridge1 interface=ether1_PC
add bridge=bridge1 interface=bonding1
```



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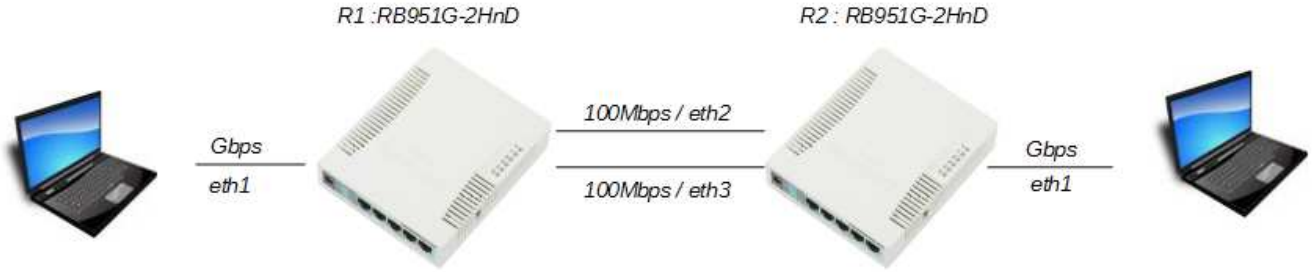
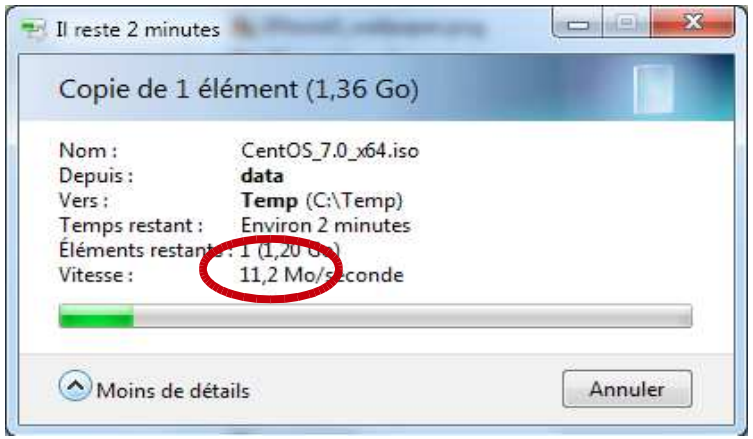
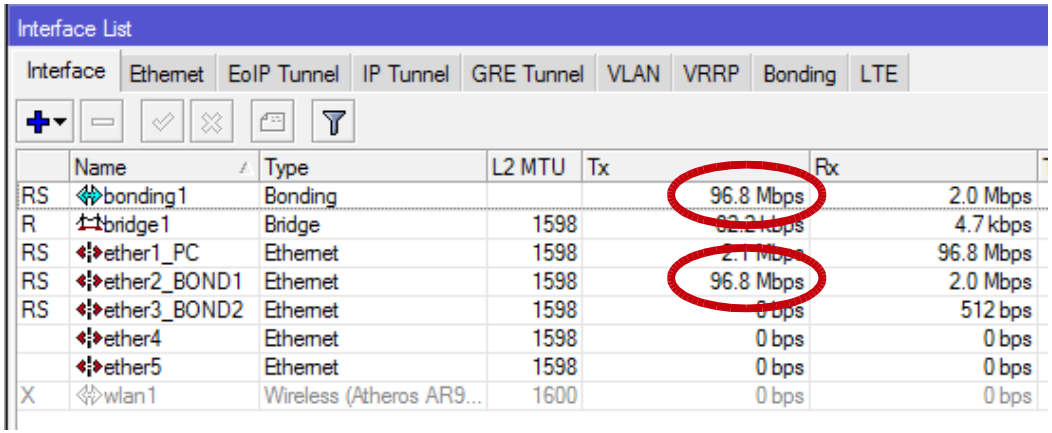
Mise en pratique #1 : ethernet

Copie de fichier







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Mise en pratique #1 : ethernet

Test de redondance : coupure eth2

Interface List

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

	Name	Type	L2 MTU	Tx	Rx
RS	bonding1	Bonding		97.1 Mbps	2.0 Mbps
R	bridge1	Bridge	1598	81.7 kbps	4.2 kbps
RS	ether1_PC	Ethernet	1598	2.1 Mbps	97.1 Mbps
S	ether2_BOND1	Ethernet	1598	0 bps	0 bps
RS	ether3_BOND2	Ethernet	1598	97.1 Mbps	2.0 Mbps
	ether4	Ethernet	1598	0 bps	0 bps
	ether5	Ethernet	1598	0 bps	0 bps
X	wlan1	Wireless (Atheros AR9...	1600	0 bps	0 bps

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Mise en pratique #1 : ethernet

Test de redondance : coupure eth1

Interface List

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

	Name	Type	L2 MTU	Tx	Rx	Tx
RS	bonding1	Bonding		99.2 Mbps	2.1 Mbps	
R	bridge1	Bridge	1598	79.5 kbps	3.3 kbps	
RS	ether1_PC	Ethernet	1598	2.1 Mbps	99.2 Mbps	
RS	ether2_BOND1	Ethernet	1598	99.2 Mbps	2.1 Mbps	
S	ether3_BOND2	Ethernet	1598	0 bps	0 bps	
	ether4	Ethernet	1598	0 bps	0 bps	
	ether5	Ethernet	1598	0 bps	0 bps	
X	wlan1	Wireless (Atheros AR9...	1600	0 bps	0 bps	

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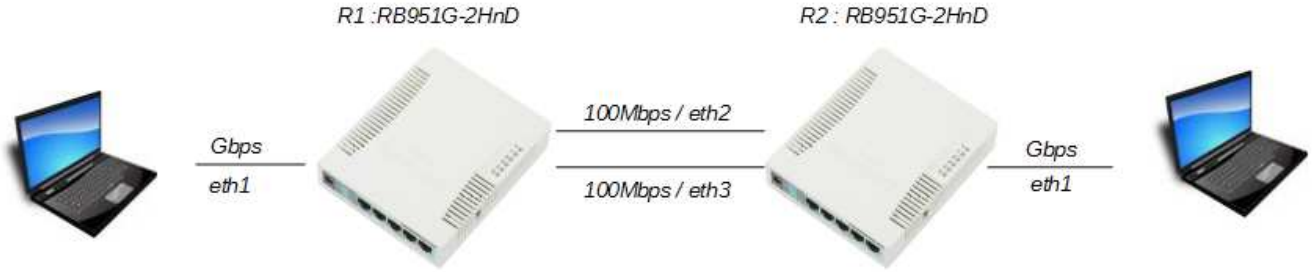
Mise en pratique #1 : ethernet

Limitation du LACP




```
C:\Utils\iperf>iperf3.exe -c 192.168.1.58 -i 10 -P 2
Connecting to host 192.168.1.58, port 5201
[  4] local 192.168.1.67 port 49246 connected to 192.168.1.58 port 5201
[  6] local 192.168.1.67 port 49247 connected to 192.168.1.58 port 5201
[ ID] Interval           Transfer     Bandwidth
[  4]   0.00-10.02  sec  60.5 MBytes  50.7 Mbits/sec
[  6]   0.00-10.02  sec  53.0 MBytes  44.4 Mbits/sec
[SUM]   0.00-10.02  sec   114 MBytes  95.1 Mbits/sec


iperf Done.
```

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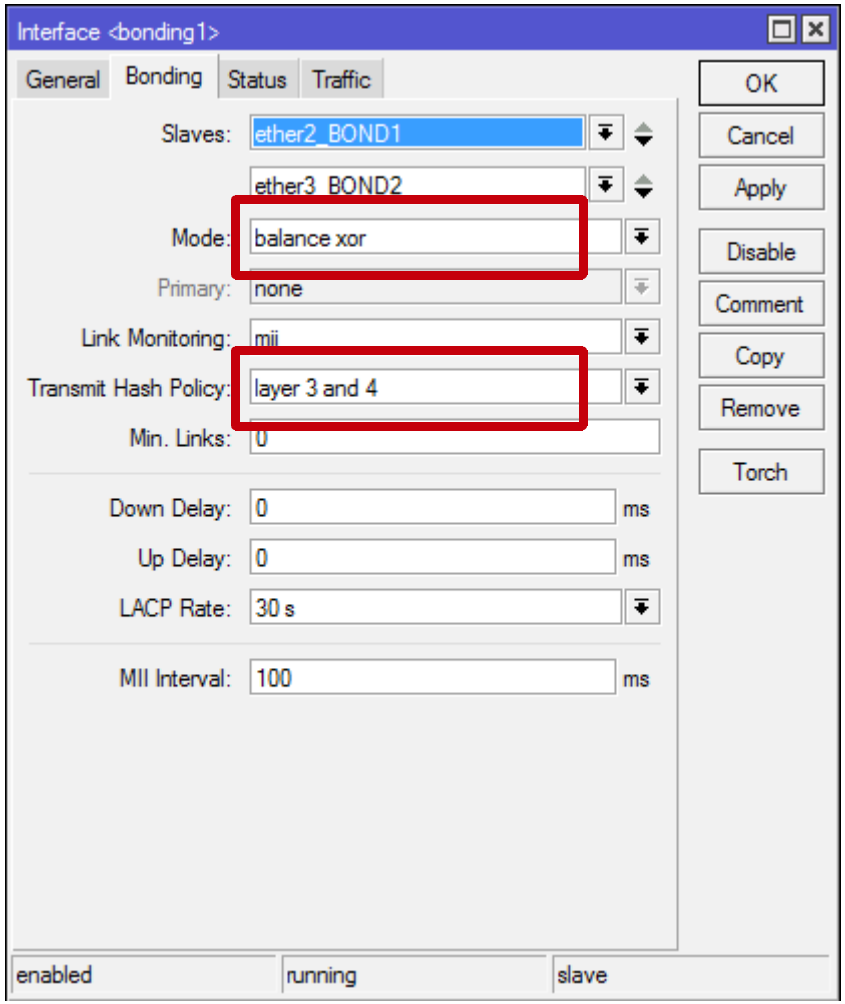
Mise en pratique #1 : ethernet

Amélioration : « balance XOR »



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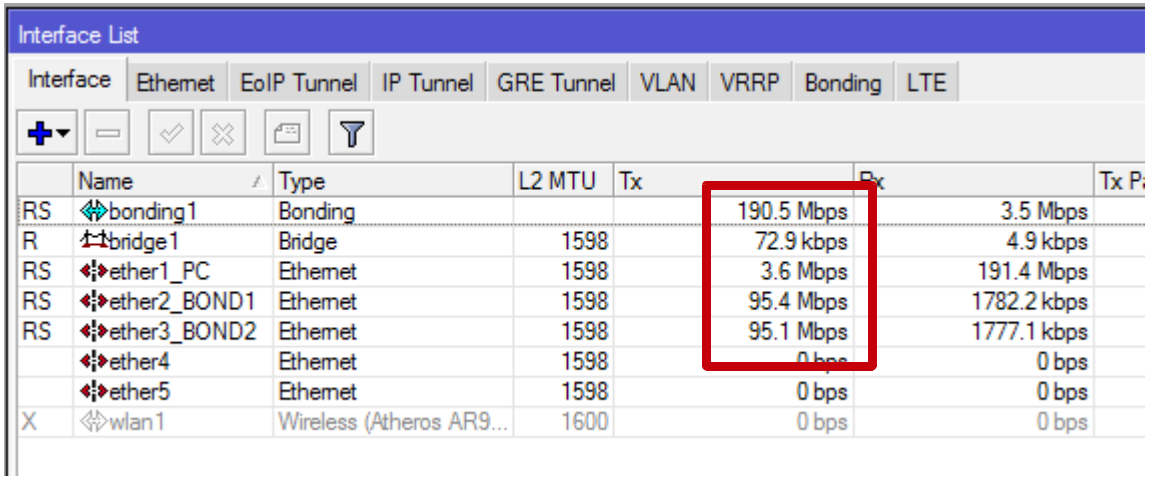
Mise en pratique #1 : ethernet

Amélioration : « balance XOR »

```
C:\Utils\iperf>iperf3.exe -c 192.168.1.58 -i 10 -P 2 -l 512k
Connecting to host 192.168.1.58, port 5201
[  4] local 192.168.1.67 port 49297 connected to 192.168.1.58 port 5201
[  6] local 192.168.1.67 port 49298 connected to 192.168.1.58 port 5201
[ ID] Interval           Transfer     Bandwidth
[  4]   0.00-10.02  sec   102 MBytes  85.7 Mbits/sec
[  6]   0.00-10.02  sec   101 MBytes  84.7 Mbits/sec
[SUM]   0.00-10.02  sec   204 MBytes   170 Mbits/sec
```



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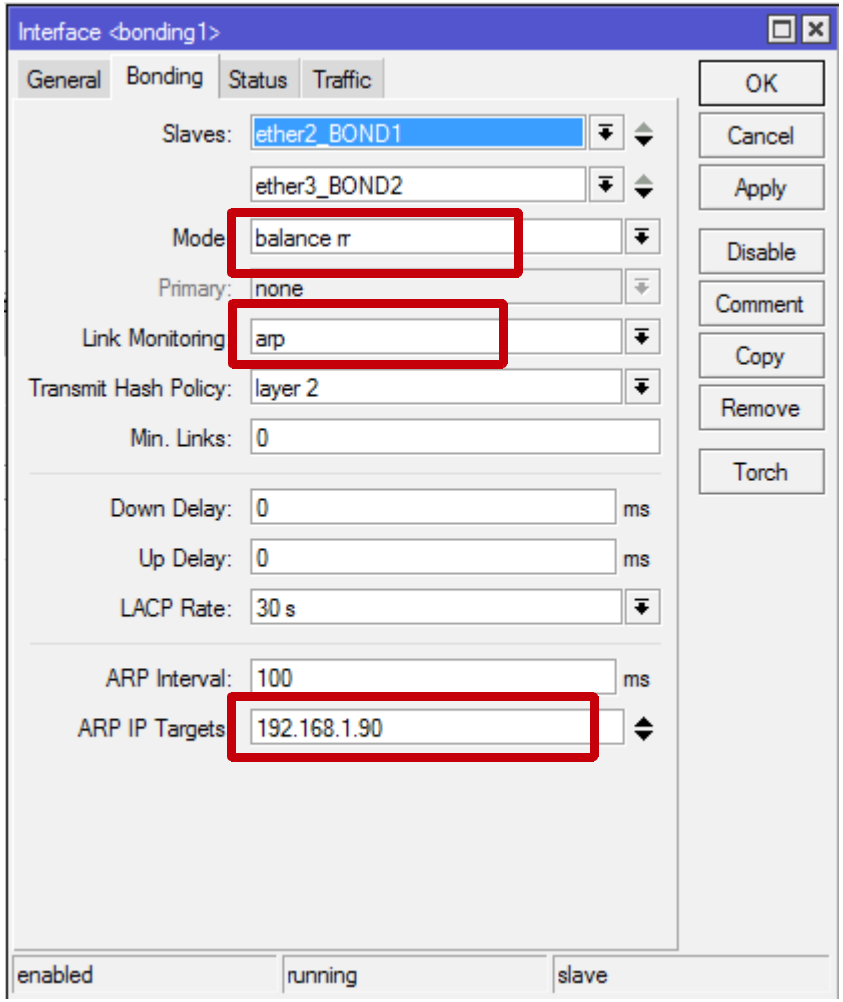
Mise en pratique #1 : ethernet

Nouvelle Amélioration : « balance RR »



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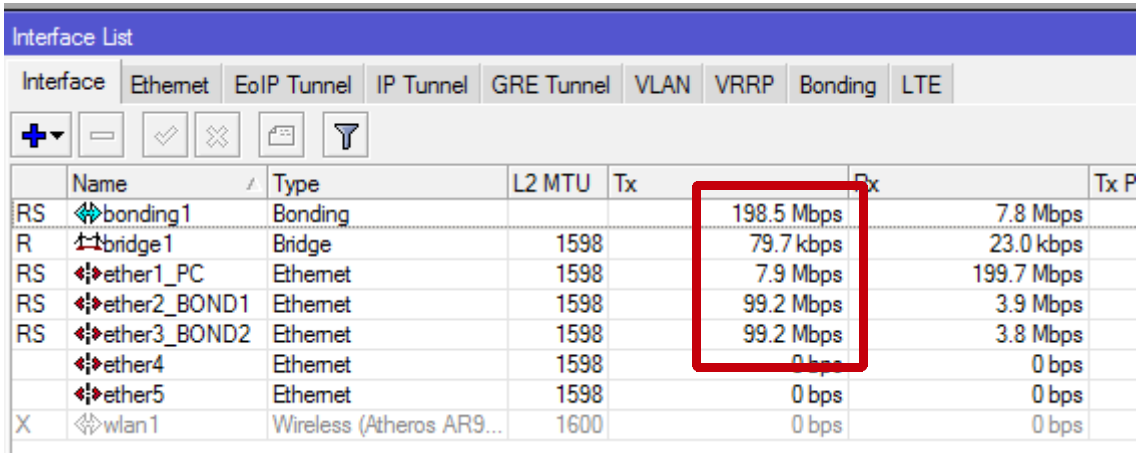
Mise en pratique #1 : ethernet

Nouvelle Amélioration : « balance RR »

```
C:\Utils\iperf>iperf3.exe -c 192.168.1.58 -i 10 -P 1 -l 512k -t 30
Connecting to host 192.168.1.58, port 5201
[  4] local 192.168.1.67 port 49309 connected to 192.168.1.58 port 5201
[ ID] Interval           Transfer     Bandwidth
[  4]   0.00-10.02  sec   225 MBytes   189 Mbits/sec
[  4]  10.02-20.01  sec   220 MBytes   184 Mbits/sec
[  4]  20.01-30.01  sec   222 MBytes   186 Mbits/sec
```



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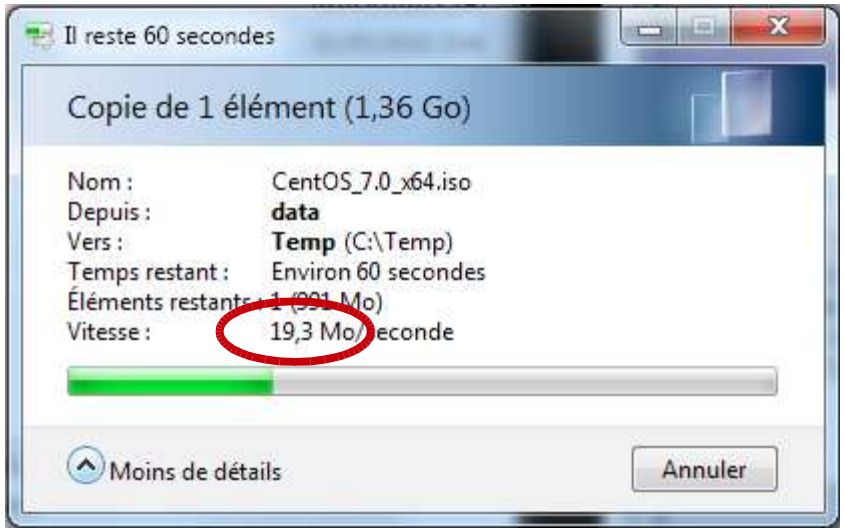
Mise en pratique #1 : ethernet

Nouvelle Amélioration : « balance RR »



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Mise en pratique #2

Liaison Wifi point-à-point

Mise en pratique #2 : Wifi

Vue globale

- Plate-forme de transporteur routier
- Nouvel entrepôt (extension)
- Besoin : liaison rapide (LAN) et fiable
- En pleine campagne
- ~800m

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Mise en pratique #2 : Wifi

RBSXT5nDr2

- Antenne directionnelle 15°
- 5Ghz 802.11a/n @40Mhz (300Mbps)
- Gain d’antenne : 16dBi
- POE IN 8-30v
- RouterOS
- ~60 € !!

RB750UP

- Routeur 5 ports fast ethernet
- POE OUT 8-30V sur 4 ports
- RouterOS
- ~60 € !!

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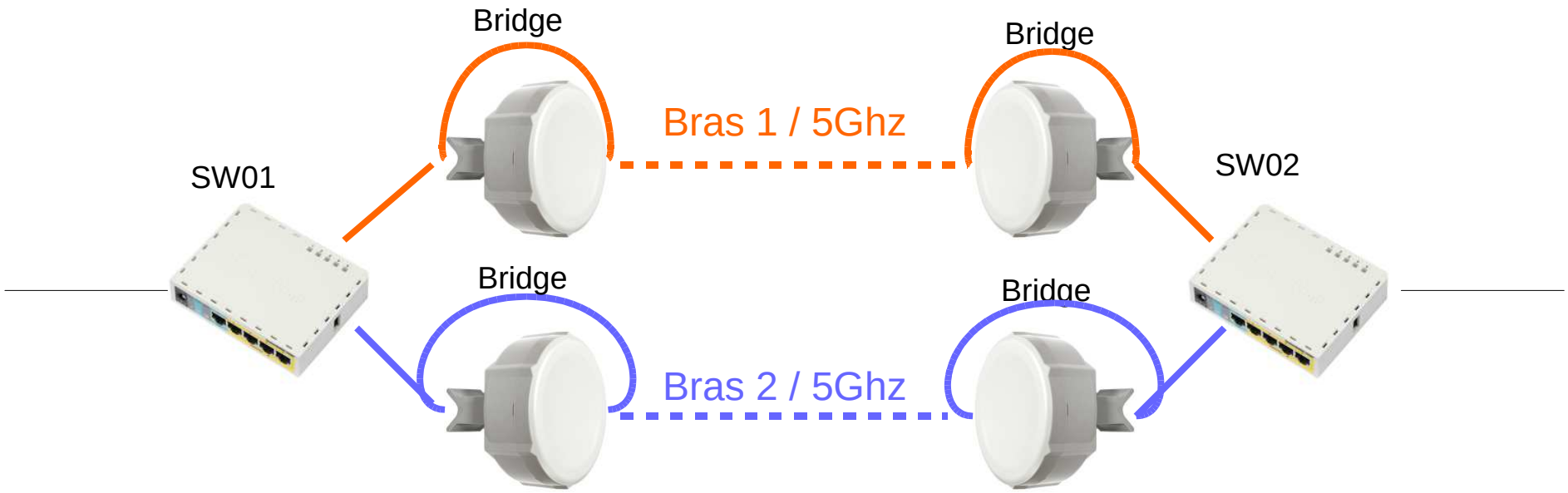
Mise en pratique #2 : Wifi

Solution retenue



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Mise en pratique #2 : Wifi

Lien WIFI : préparation

SX01 SX05

Scan de l'environnement :
/interface wireless spectral-history

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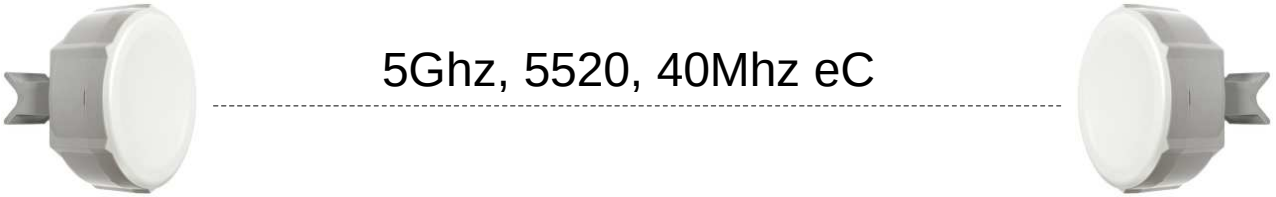
Mise en pratique #2 : Wifi

Lien WIFI : configuration




```
/interface wireless security-profiles
set [ find default=yes ]
add authentication-types=wpa2-psk name=profil_secure
wpa2-pre-shared-key=PASSPHRASE1337

/interface wireless
set [ find default-name=wlan1 ] antenna-gain=16 band=5ghz-onlyn channel-width=20/40mhz-eC \
    country=france disabled=no frequency=5520 frequency-mode=regulatory-domain hide-ssid=yes \
    mode=bridge security-profile=profil_secure ssid=BYA0105 wds-default-bridge=bridge_wds \
    wds-mode=dynamic-mesh wireless-protocol=nstreme
/interface wireless nstreme
set wlan1 enable-nstreme=yes
```

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Mise en pratique #2 : Wifi

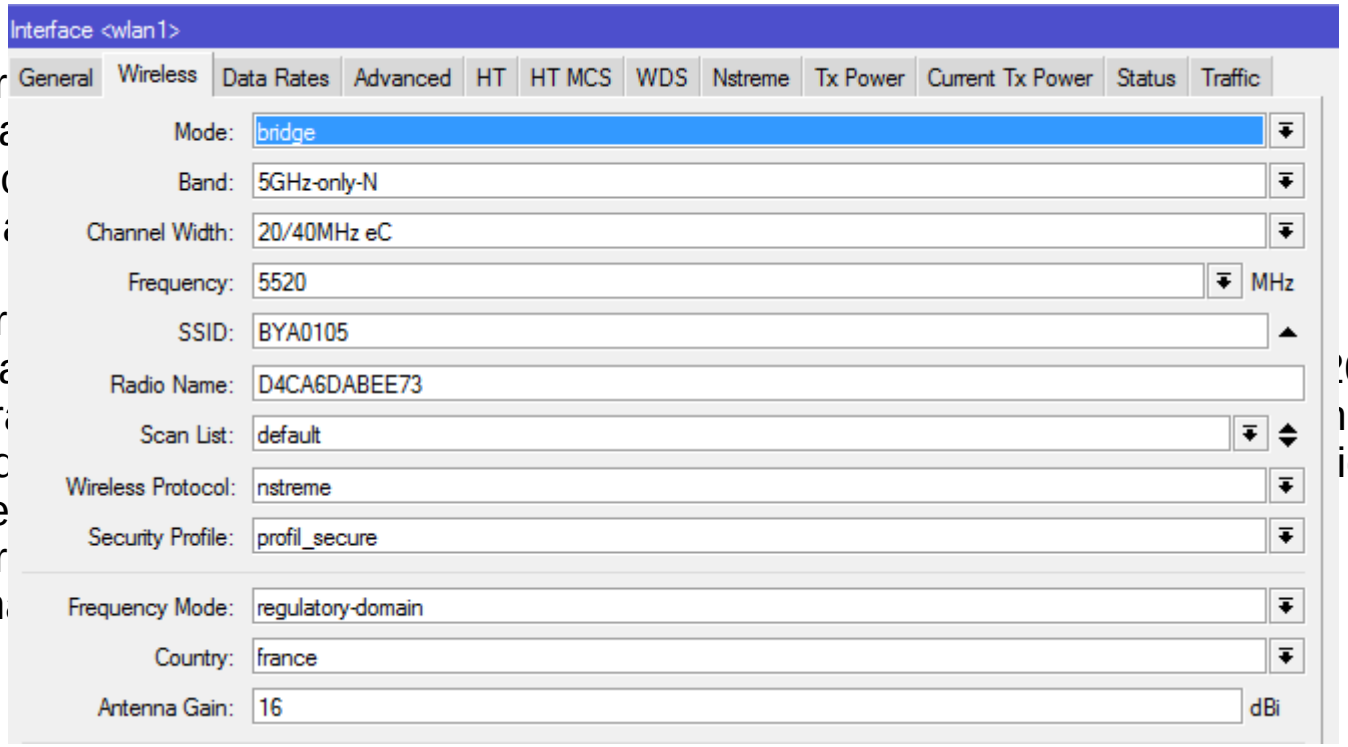
Lien WIFI : configuration

5Ghz, 5520, 40Mhz eC

SX01 SX05

```
/interface wir
set [ find defa
add authentic
wpa2-pre-sha

/interface wir
set [ find defa                                                    20/40mhz-eC \
    country=fra                                                    hide-ssid=yes \
    mode=bric                                                      idge_wds \
    wds-mode
/interface wir
set wlan1 ena
```



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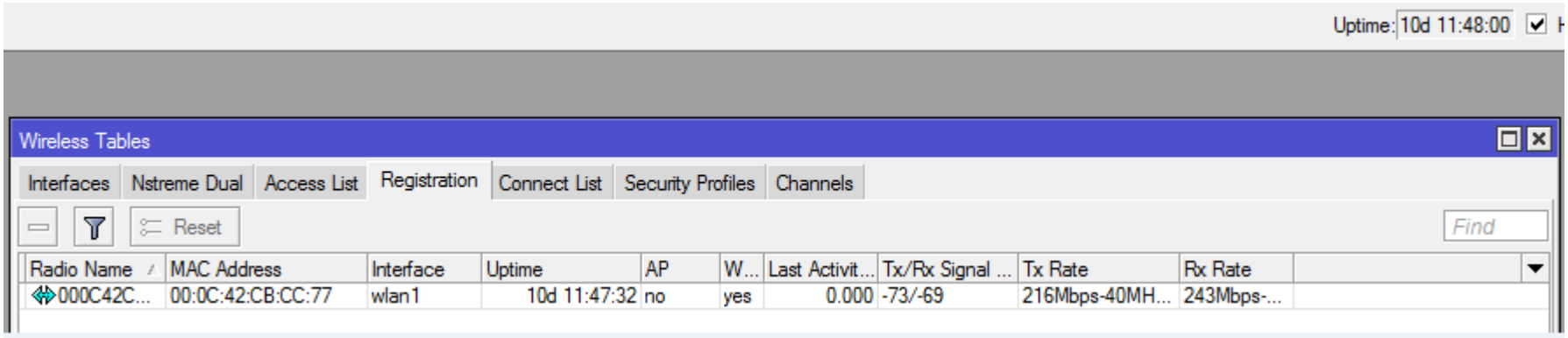
Mise en pratique #2 : Wifi

Lien WIFI : configuration

SX01 SX05



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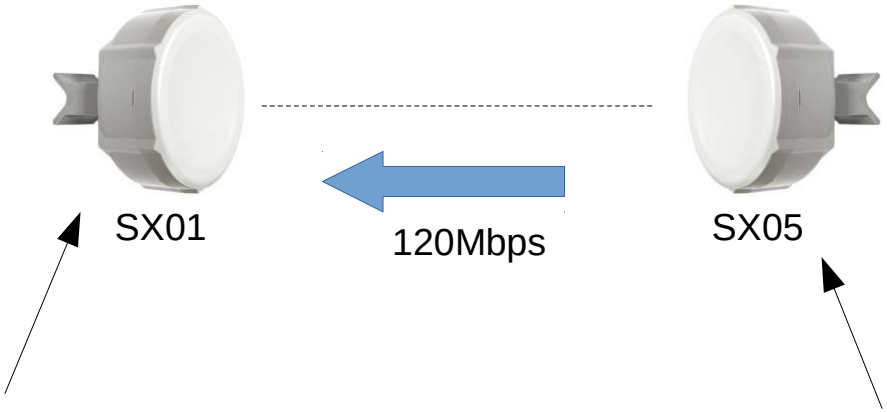
Mise en pratique #2 : Wifi

Test avec l'outil intégré « traffic-generator »



Visualisation
/interface wireless monitor wlan1

et/ou

/interface monitor-traffic wlan1

Génération de flux tcp
/tool traffic-generator packet-template
add header-stack=mac,ip,udp
name=packet-test-download
ip-protocol=tcp
ip-src=10.94.105.11
ip-dst=10.94.105.10

/tool traffic-generator
start mbps=120 tx-template=packet-test-download

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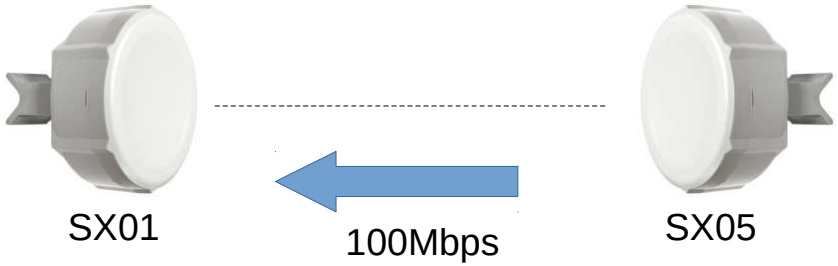
Mise en pratique #2 : Wifi

Test avec l'outil intégré « traffic-generator »

Bras 1 :



Wireless Tables

Interfaces | Nstreme Dual | Access List | Registration | Connect List | Security Profiles | Channels

CAP | Scanner | Freq. Usage | Alignment | Wireless Sniffer | Wireless Snooper

	Name	Type	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)	FP Tx
RS	wlan1	Wireless (Atheros AR92xx)	1600	2.1 kbps	106.4 Mbps	4	8 792	
DRS	wds2	WDS	1600	1752 bps	106.4 Mbps	3	8 792	

2 items out of 4 (1 selected)

```
[atlanteam@BYA_SX01] > /interface monitor-traffic wlan1
                        name:      wlan1
      rx-packets-per-second:      8 792
         rx-bits-per-second:  106.4Mbps
   fp-rx-packets-per-second:      8 792
      fp-rx-bits-per-second:  106.4Mbps
        rx-drops-per-second:          0
       rx-errors-per-second:          0
      tx-packets-per-second:          4
         tx-bits-per-second:    2.1kbps
   fp-tx-packets-per-second:          2
```

```
[atlanteam@BYA_SX01] > /interface wireles
                    status: running-ap
                   channel: 5520/20-eC/an(11
     wireless-protocol: nstreme
           noise-floor: -115dBm
       overall-tx-ccq: 71%
    registered-clients: 1
  authenticated-clients: 1
               polling: yes
          csma-disabled: no
            wmm-enabled: yes
```

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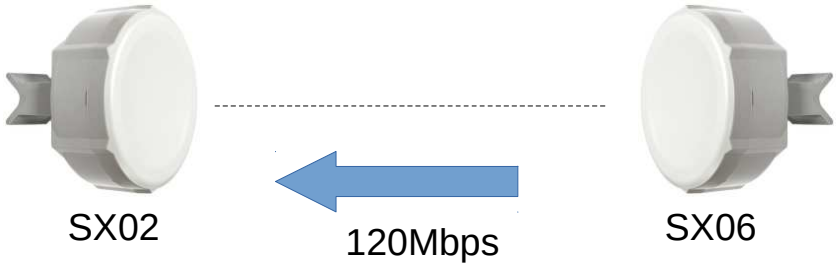
Mise en pratique #2 : Wifi

Test avec l'outil intégré « traffic-generator »

Bras 2 :



Interface List

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

	Name	Type	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)
R	bridge_wds	Bridge	1598	54.4 kbps	122.7 Mbps	10	10 143
RS	ether1	Ethernet	1598	55.7 kbps	7.6 kbps	12	10
R	wlan1	Wireless (Atheros AR9...	1600	2.0 kbps	122.7 Mbps	3	10 138
DRS	wds1	WDS	1600	2.0 kbps	122.7 Mbps	3	10 138

4 items

```
cs-per-second:
  2.1kbps
                        name:      wlan1
     rx-packets-per-second:     10 138
        rx-bits-per-second:  122.7Mbps
  fp-rx-packets-per-second:     10 138
     fp-rx-bits-per-second:  122.7Mbps
       rx-drops-per-second:          0
      rx-errors-per-second:          0
     tx-packets-per-second:          3
        tx-bits-per-second:    2.0kbps
  fp-tx-packets-per-second:          3
     fp-tx-bits-per-second:    2.0kbps
       tx-drops-per-second:          0
      tx-errors-per-second:          0
-- [Q quit|D dump|C-z pause]
```

```
          noise-floor: -111dBm
     overall-tx-ccq: 70%
             status: running-ap
            channel: 5580/20-eC/an(11dBm
  wireless-protocol: 802.11
        noise-floor: -111dBm
     overall-tx-ccq: 81%
  registered-clients: 1
authenticated-clients: 1
    current-distance: 1
         wmm-enabled: yes
   current-tx-powers: 6Mbps:8(8/11),9Mbps
                      HT20-1:8(8/11),HT20
                      HT40-2:8(8/11),HT40
 notify-external-fdb: no
-- [Q quit|D dump|C-z pause]
```

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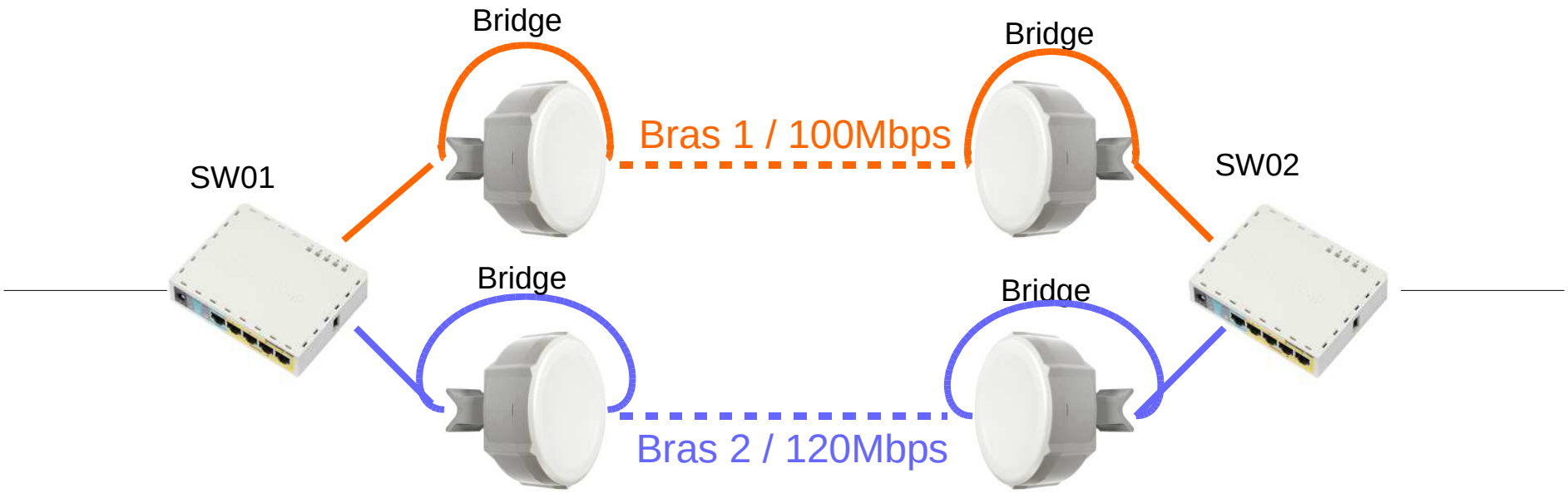
Mise en pratique #2 : Wifi

Construction du bonding



Mais… http://wiki.mikrotik.com/wiki/Manual:Interface/Bonding dit :

« Make sure that you do not have IP addresses on interfaces which will be enslaved for bonding interface! »

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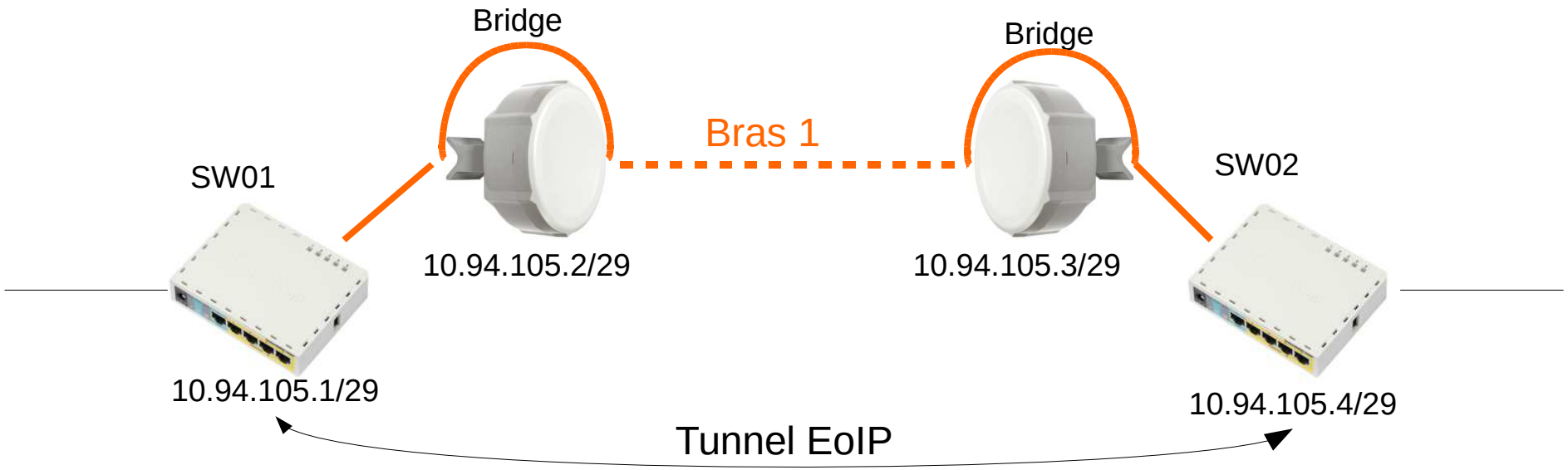
Mise en pratique #2 : Wifi

Tunnel EoIP « bras 1 »




```
/interface eoip
add name=eoip-15
local-address=10.94.105.1
remote-address=10.94.105.4
tunnel-id=15
```

```
/interface eoip
add name=eoip-15
local-address=10.94.105.4
remote-address=10.94.105.1
tunnel-id=15
```

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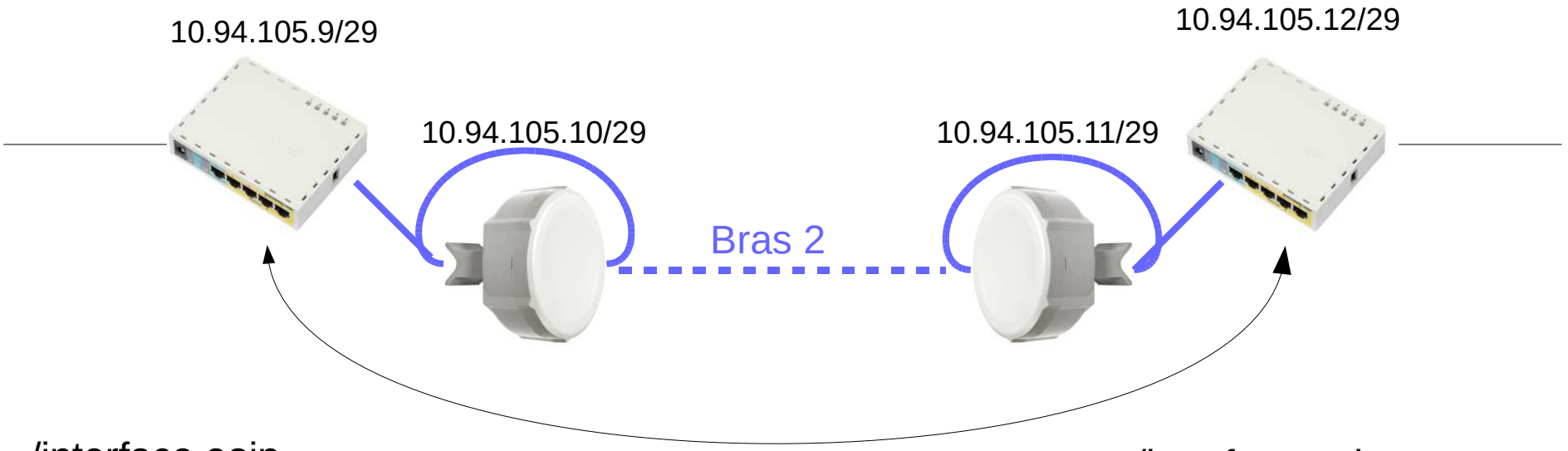
Mise en pratique #2 : Wifi

Tunnel EoIP « bras 2 »




```
/interface eoip
add name=eoip-26
local-address=10.94.105.9
remote-address=10.94.105.12
tunnel-id=26
```

```
/interface eoip
add name=eoip-26
local-address=10.94.105.12
remote-address=10.94.105.9
tunnel-id=26
```

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Mise en pratique #2 : Wifi

Construction du bonding


```
/interface bonding
name=bonding-Fort
mode=balance-rr
slaves=eoip-15,eoip-26
link-monitoring=arp
add arp-interval=1s
arp-ip-targets=10.94.105.35

/ip address
add address=10.94.105.34/29
interface=bonding-Fort
```

```
/interface bonding
name=bonding-RN141
mode=balance-rr
slaves=eoip-15,eoip-26
link-monitoring=arp
add arp-interval=1s
arp-ip-targets=10.94.105.34

/ip address
add address=10.94.105.35/29
interface=bonding-RN141
```

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Mise en pratique #2 : Wifi

Test

SW01
10.94.105.34/29

Bonding : eoip-15 + eoip-26

SW02
10.94.105.35/29

Interface List

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

	Name	Type	L2 MTU	Tx	Rx
RS	bonding-Fort	Bonding		3.4 kbps	156.6 Mbps
R	bridge_switch	Bridge	1600	74.4 kbps	155.1 Mbps
RS	eoip-15	EoIP Tunnel	65535	2.1 kbps	71.2 Mbps
RS	eoip-26	EoIP Tunnel	65535	1344 bps	85.3 Mbps
RS	ether1_LAN_RN141	Ethernet	1600	74.8 kbps	5.6 kbps
R	ether2_FORT_5580_SX02	Ethernet	1598	2.1 kbps	93.4 Mbps
R	ether3_FORT_5520_SX01	Ethernet	1598	2.0 kbps	78.7 Mbps
	ether4	Ethernet	1598	0 bps	0 bps
	ether5	Ethernet	1598	0 bps	0 bps

9 items

```
[atlanteam@BYA_SW01] > /interface monitor-traffic bonding-Fort,ether3_FORT_5520_SX01,eth
                  name:  bonding-Fort ether3_FORT_5520_SX01 ether2_FORT_5580_SX02
  rx-packets-per-second:       13 013                12 184                14 838
    rx-drops-per-second:            0                     0                     0
   rx-errors-per-second:            0                     0                     0
     rx-bits-per-second:      157.5Mbps              78.8Mbps              95.1Mbps
  tx-packets-per-second:            4                     2                     2
    tx-drops-per-second:            0                     0                     0
   tx-errors-per-second:            0                     0                     0
     tx-bits-per-second:      2.6kbps               1408bps               1408bps
-- [Q quit|D dump|C-z pause]
```

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Mise en pratique #2 : Wifi

Panne !

Interface List

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

	Name	Type	L2 MTU	Tx	Rx
RS	bonding-Fort	Bonding		2.1 kbps	92.0 Mbps
R	bridge_switch	Bridge	1600	109.6 kbps	91.2 Mbps
RS	eoip-15	EoIP Tunnel	65535	704 bps	0 bps
RS	eoip-26	EoIP Tunnel	65535	1400 bps	92.1 Mbps
RS	ether1_LAN_RN141	Ethernet	1600	109.6 kbps	[illegible]
R	ether2_FORT_5580_SX02	Ethernet	1598	2.4 kbps	102.1 Mbps
R	ether3_FORT_5520_SX01	Ethernet	1598	4.3 kbps	32.1 kbps
	ether4	Ethernet	1598	0 bps	[illegible]
	ether5	Ethernet	1598	0 bps	0 bps

9 items

```
[atlanteam@BYA_SW01] > /interface monitor-traffic bonding-Fort,ether3_FORT_5520_SX01,ethe
                 name:  bonding-Fort ether3_FORT_5520_SX01 ether2_FORT_5580_SX02
   rx-packets-per-second:       7 611                    4                14 749
     rx-drops-per-second:           0                    0                     0
    rx-errors-per-second:           0                    0                     0
      rx-bits-per-second:     92.1Mbps              29.1kbps              94.2Mbps
   tx-packets-per-second:           5                    5                     4
     tx-drops-per-second:           0                    0                     0
    tx-errors-per-second:           0                    0                     0
      tx-bits-per-second:     3.5kbps               3.5kbps               3.0kbps
-- [Q quit|D dump|C-z pause]
```

Terminal

```
  45 10.94.105.35                                56  64 1ms
  46 10.94.105.35                                56  64 2ms
  47 10.94.105.35                                56  64 4ms
  48 10.94.105.35                                56  64 2ms
  49 10.94.105.35                                56  64 1ms
  50 10.94.105.35                                56  64 11ms
  51 10.94.105.35                                56  64 3ms
  52 10.94.105.35                                          timeout
  53 10.94.105.35                                          timeout
  54 10.94.105.35                                          timeout
  55 10.94.105.35                                56  64 125ms
  56 10.94.105.35                                          timeout
  57 10.94.105.35                                          timeout
  58 10.94.105.35                                56  64 129ms
  59 10.94.105.35                                56  64 76ms
    sent=60 received=55 packet-loss=8% min-rtt=1ms avg-rtt=10ms max-rtt=129ms
SEQ HOST                                        SIZE TTL TIME  STATUS
  60 10.94.105.35                                56  64 45ms
  61 10.94.105.35                                56  64 43ms
  62 10.94.105.35                                56  64 43ms
  63 10.94.105.35                                56  64 49ms
  64 10.94.105.35                                56  64 43ms
  65 10.94.105.35                                56  64 45ms
  66 10.94.105.35                                56  64 43ms
  67 10.94.105.35                                56  64 45ms
  68 10.94.105.35                                56  64 44ms
  69 10.94.105.35                                56  64 43ms
  70 10.94.105.35                                56  64 44ms
  71 10.94.105.35                                56  64 45ms
  72 10.94.105.35                                56  64 42ms
  73 10.94.105.35                                56  64 64ms
  74 10.94.105.35                                56  64 44ms
  75 10.94.105.35                                56  64 42ms
  76 10.94.105.35                                56  64 38ms
```

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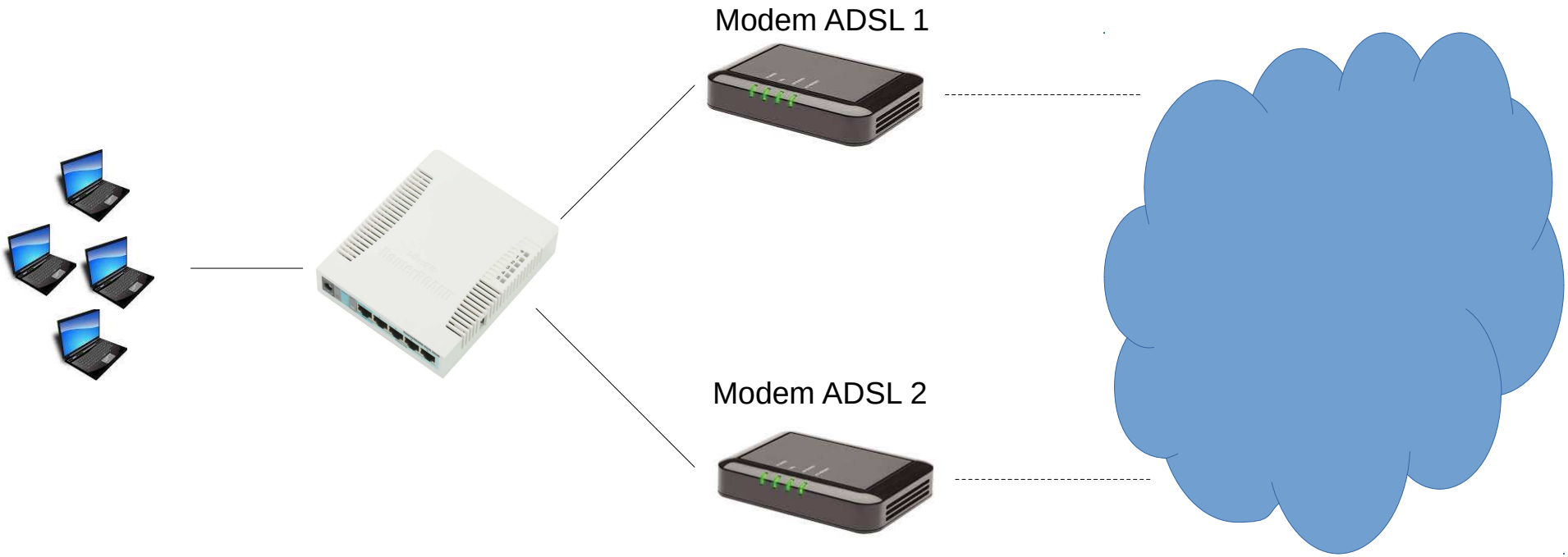
Mise en pratique #3

Liaisons ADSL

Mise en pratique #3 : ADSL

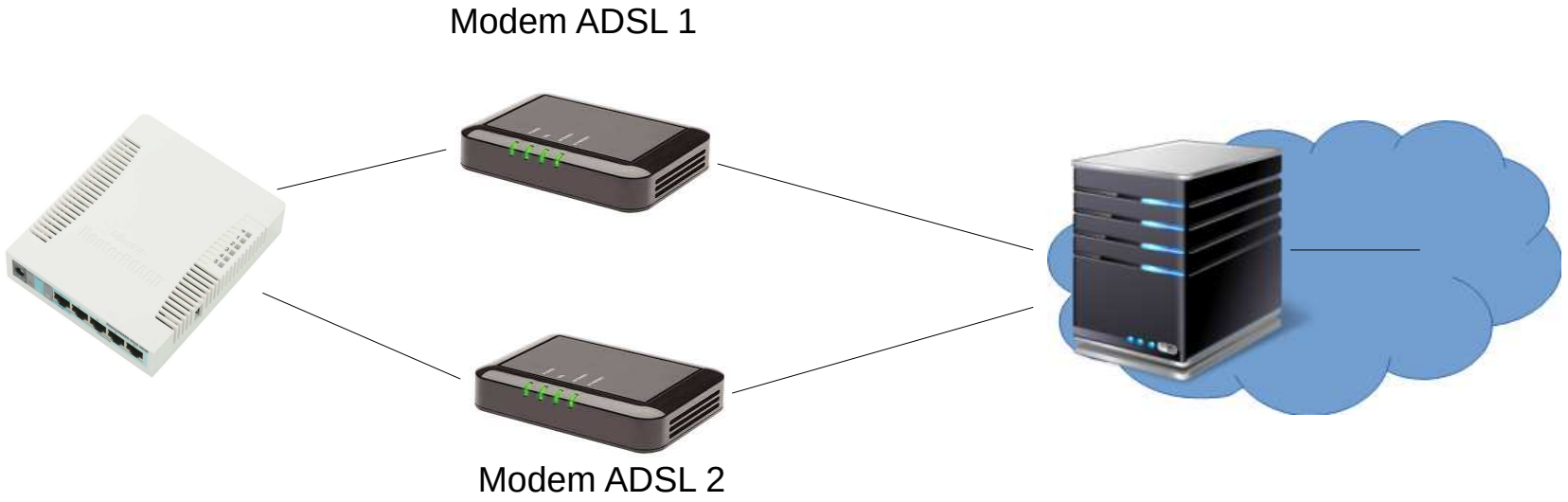
Vue globale



Objectif : redondance, répartition de charge, agrégation

Mise en pratique #3 : ADSL

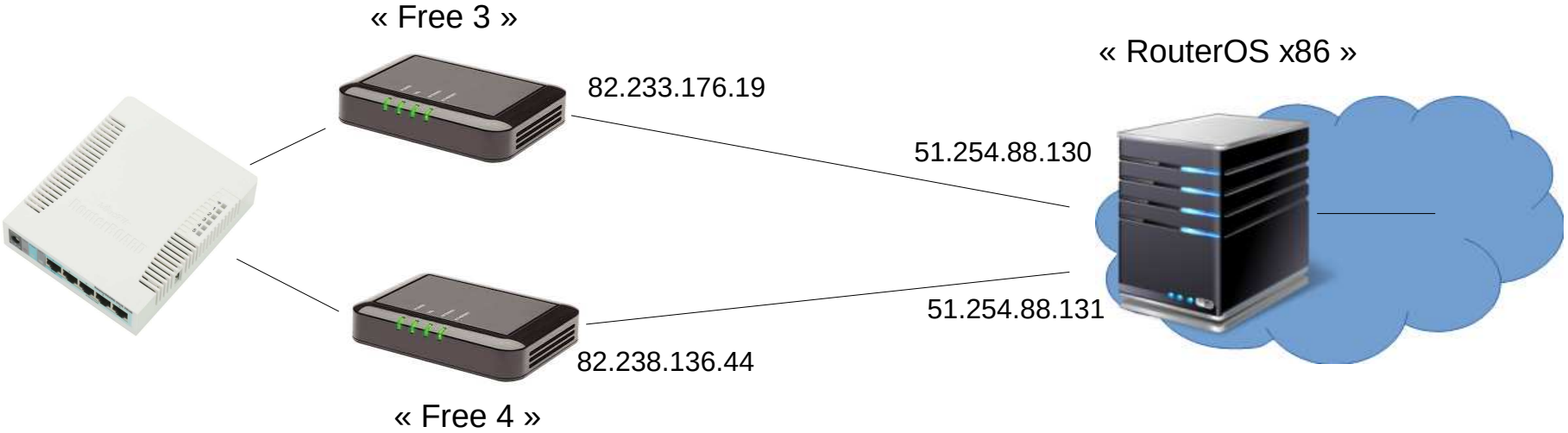
Architecture choisie



1 Serveur RouterOS « dans le cloud » servira d'extrémité au bonding

Mise en pratique #3 : ADSL

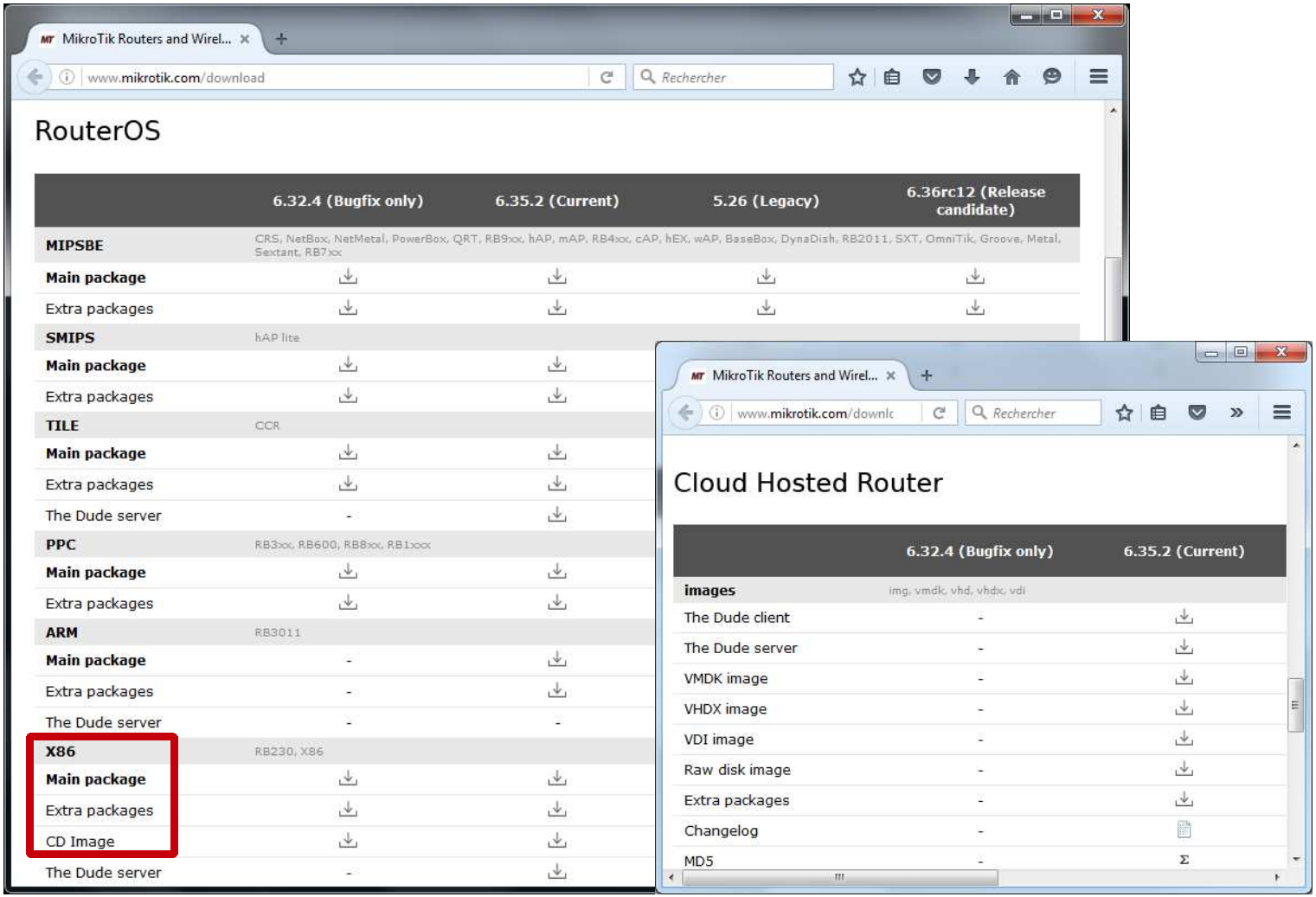
Implémentation



1 Serveur RouterOS x86 « dans le cloud » servira d'extrémité au bonding

Mise en pratique #3

« RouterOS x86 ?? »



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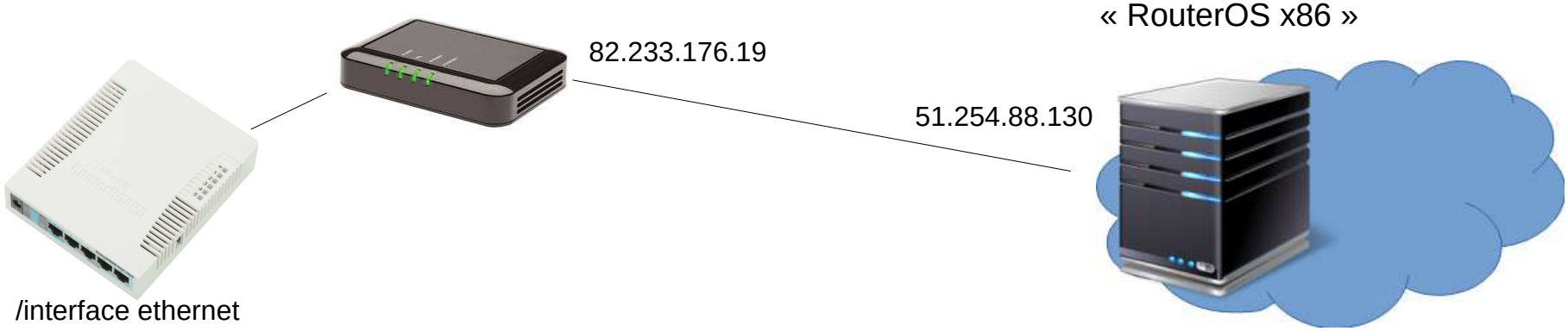
Mise en pratique #3 : ADSL

Configuration : bras « Free3 »

« Free 3 »

« RouterOS x86 »



/interface ethernet
set [find default-name=ether3] name=ether3_FREE3

/ip dhcp-client
interface=ether3_FREE3
add add-default-route=no
use-peer-dns=no use-peer-ntp=no

/ip route
dst-address=51.254.88.130/32
gateway=82.233.176.254

/interface eoip
add name=eoip-free3
local-address=82.233.176.19
remote-address=51.254.88.130
tunnel-id=1003

/interface eoip
add name=eoip-free3
local-address=51.254.88.130
remote-address=82.233.176.19
tunnel-id=1003

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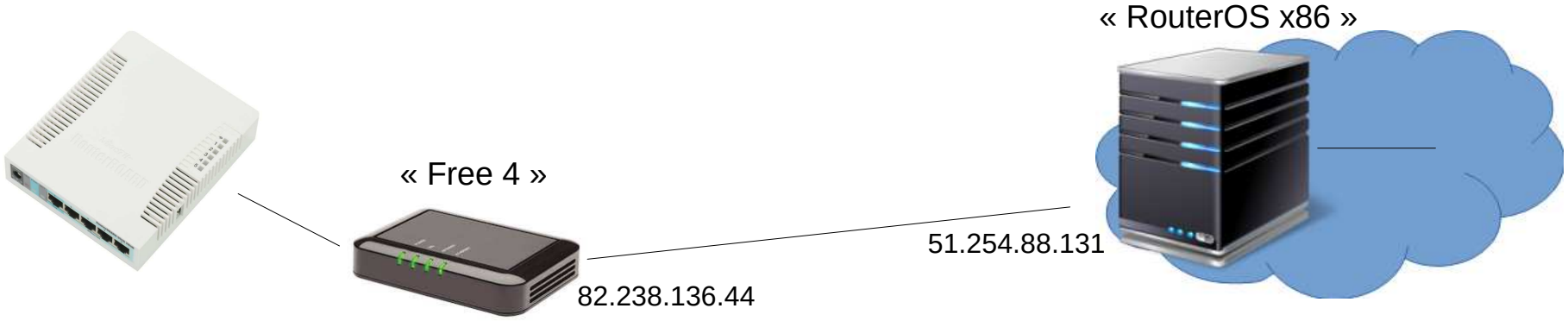
Mise en pratique #3 : ADSL

Configuration : bras « Free4 »




```
/interface ethernet
set [ find default-name=ether4 ] name=ether4_FREE4

/ip dhcp-client
add interface=ether4_FREE4
add-default-route=no
use-peer-dns=no use-peer-ntp=no

/ip route
add dst-address=51.254.88.131/32
gateway=82.238.136.254

/interface eoip
add  name=eoip-free4
local-address=82.238.136.44
remote-address=51.254.88.131
tunnel-id=1004
```

```
/interface eoip
add name=eoip-free4
local-address=51.254.88.131
Remote-address=82.238.136.144
tunnel-id=1004
```

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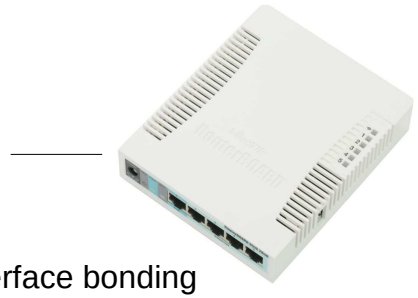
Mise en pratique #3 : ADSL

Configuration du bonding

10.0.0.2/30



Bras eoip-free3

Bras eoip-free4

10.0.0.1/30

```
/interface bonding
add name=bonding1
slaves=eoip-free3,eoip-free4
link-monitoring=arp
arp-interval=200ms arp-ip-targets=10.0.0.1

/ip address
add address=10.0.0.2/30 interface=bonding1
```

Address List

	Address	Network	Interface
	10.0.0.2/30	10.0.0.0	bonding1
D	82.233.176.19/24	82.233.176.0	ether3_FREE3
D	82.238.136.44/24	82.238.136.0	ether4_FREE4
	192.168.0.252/24	192.168.0.0	ether1_LAN

```
/interface bonding
add name=bonding1
slaves=eoip-free3,eoip-free4
link-monitoring=arp
arp-interval=200ms arp-ip-targets=10.0.0.1

/ip address
add address=10.0.0.1/30 interface=bonding1
```

Address List

Find

	Address	Network	Interface
	10.0.0.1/30	10.0.0.0	bonding1
	51.254.88.130	37.187.141.254	ether1
	51.254.88.131	37.187.141.254	ether2

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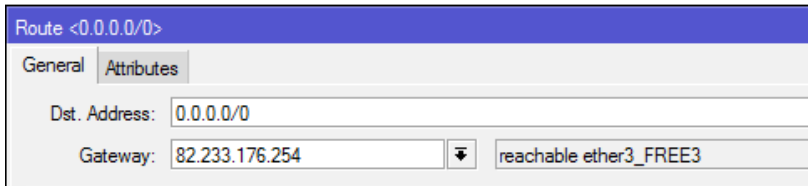
Mise en pratique #3 : ADSL

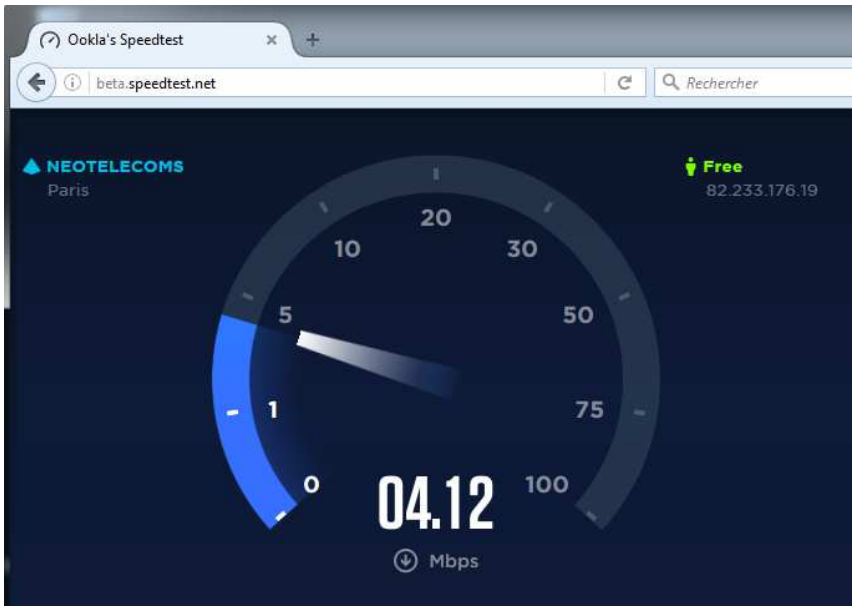
Test Free3 seule

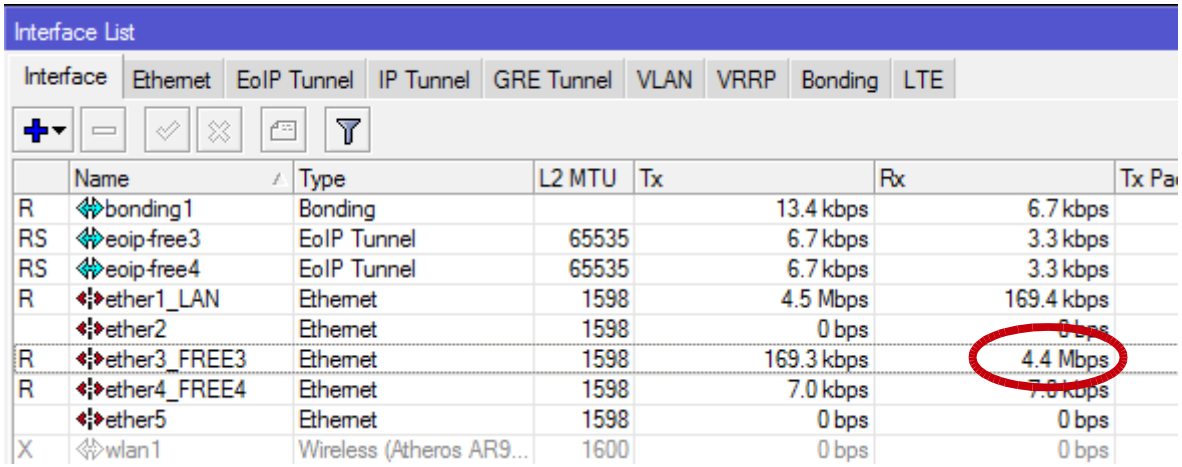
« Free 3 »



/ip route
add gateway=82.233.176.254

/ip firewall nat
add action=masquerade chain=srcnat
src-address=192.168.0.0/24





	Name	Type	L2 MTU	Tx	Rx	Tx Pa
R	bonding1	Bonding		13.4 kbps	6.7 kbps	
RS	eoip-free3	EoIP Tunnel	65535	6.7 kbps	3.3 kbps	
RS	eoip-free4	EoIP Tunnel	65535	6.7 kbps	3.3 kbps	
R	ether1_LAN	Ethernet	1598	4.5 Mbps	169.4 kbps	
	ether2	Ethernet	1598	0 bps	0 bps	
R	ether3_FREE3	Ethernet	1598	169.3 kbps	4.4 Mbps	
R	ether4_FREE4	Ethernet	1598	7.0 kbps	7.0 kbps	
	ether5	Ethernet	1598	0 bps	0 bps	
X	wlan1	Wireless (Atheros AR9...	1600	0 bps	0 bps	

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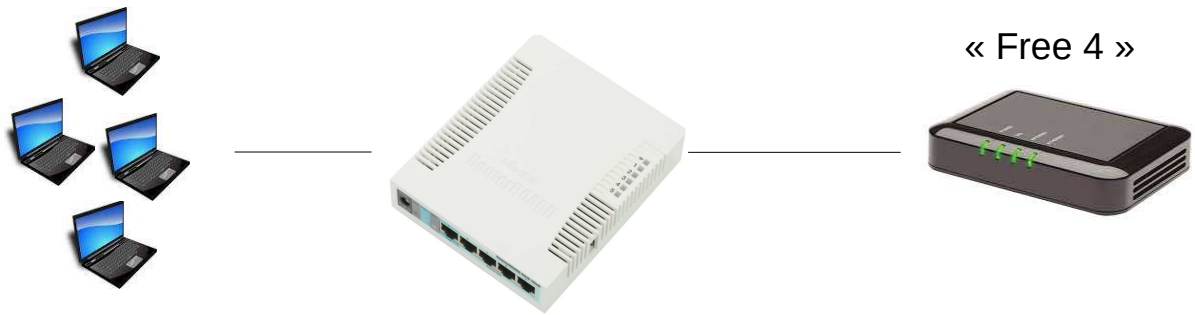
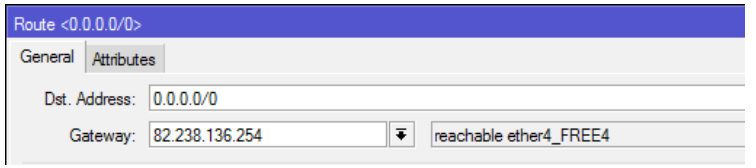
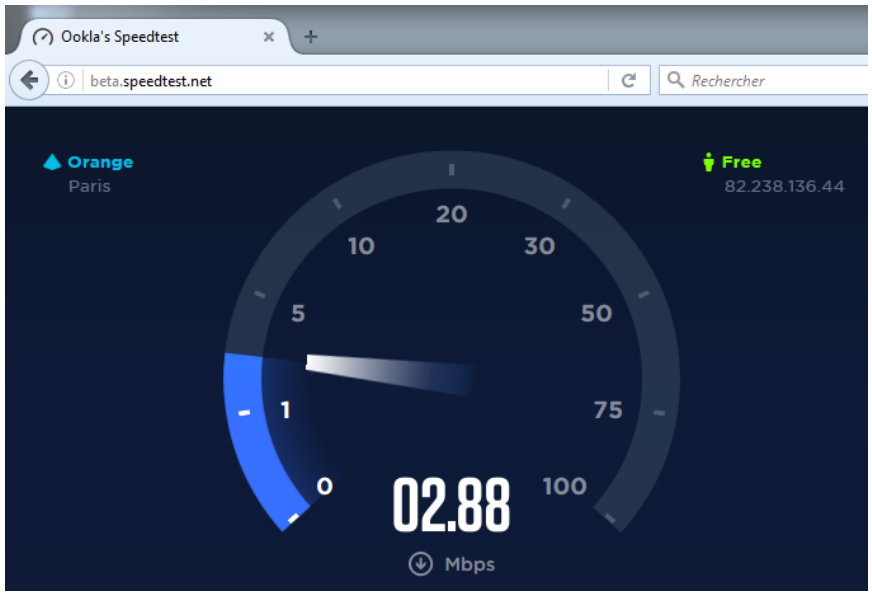
Mise en pratique #3 : ADSL

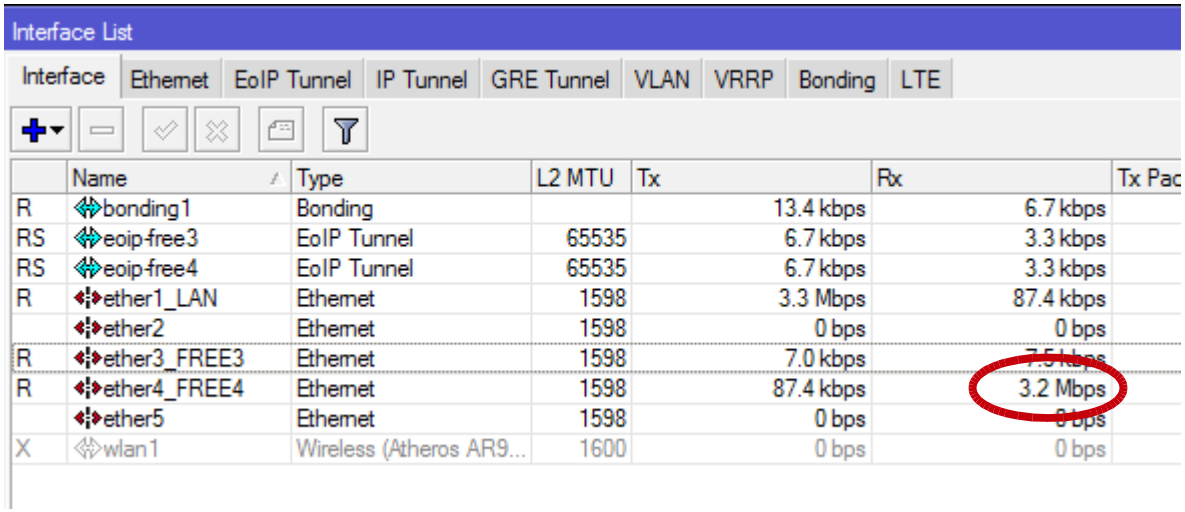
Test Free4 seule





/ip route
set [find dst-address="0.0.0.0/0"]
Gateway=82.238.136.254





	Name	Type	L2 MTU	Tx	Rx	Tx Pac
R	bonding1	Bonding		13.4 kbps	6.7 kbps	
RS	eoip-free3	EoIP Tunnel	65535	6.7 kbps	3.3 kbps	
RS	eoip-free4	EoIP Tunnel	65535	6.7 kbps	3.3 kbps	
R	ether1_LAN	Ethernet	1598	3.3 Mbps	87.4 kbps	
	ether2	Ethernet	1598	0 bps	0 bps	
R	ether3_FREE3	Ethernet	1598	7.0 kbps	7.5 kbps	
R	ether4_FREE4	Ethernet	1598	87.4 kbps	3.2 Mbps	
	ether5	Ethernet	1598	0 bps	0 bps	
X	wlan1	Wireless (Atheros AR9...	1600	0 bps	0 bps	

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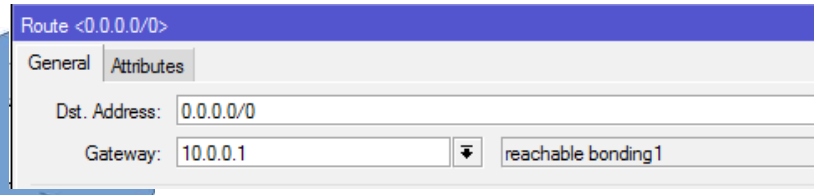
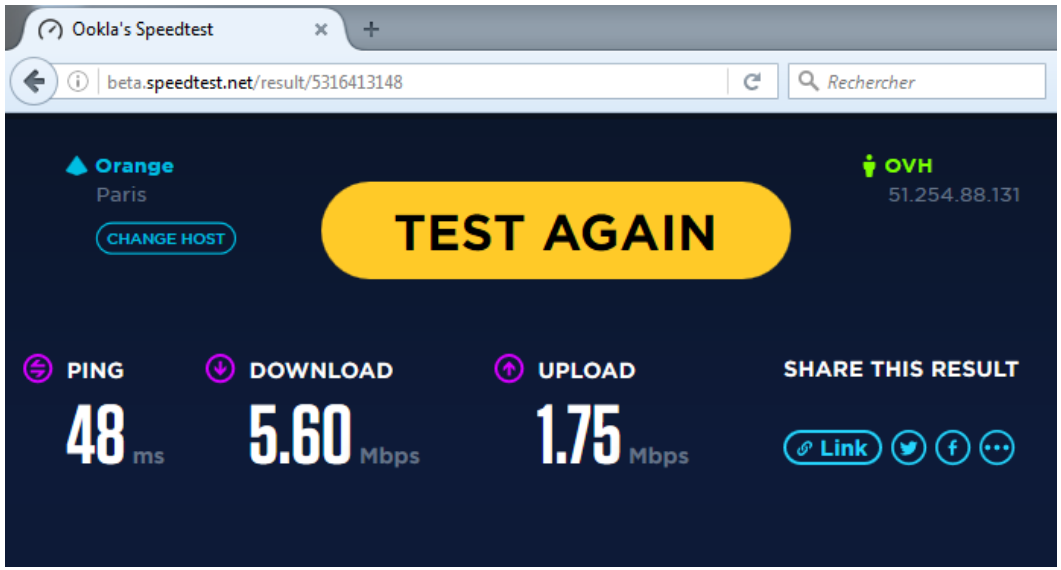
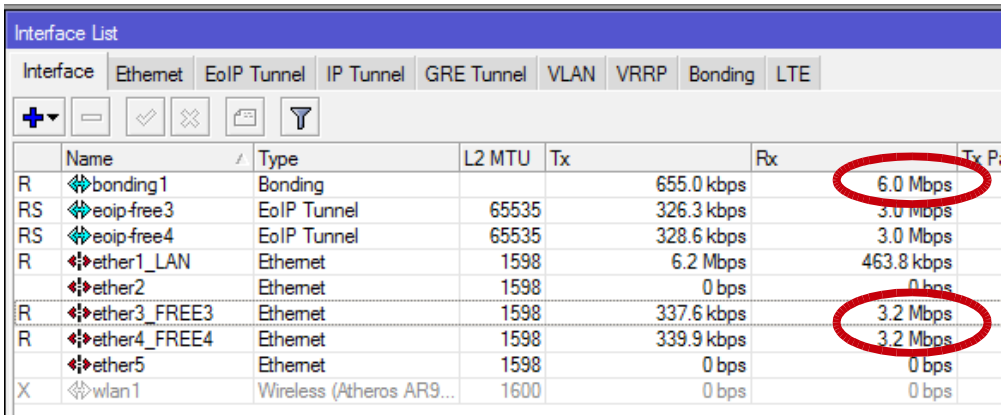
Mise en pratique #3 : ADSL

Test bonding / performances




```
/ip route
set [ find dst-address="0.0.0.0/0" ]
gateway=10.0.0.1
```





	Name	Type	L2 MTU	Tx	Rx	Tx P
R	bonding1	Bonding		655.0 kbps	6.0 Mbps	
RS	eoip-free3	EoIP Tunnel	65535	326.3 kbps	3.0 Mbps	
RS	eoip-free4	EoIP Tunnel	65535	328.6 kbps	3.0 Mbps	
R	ether1_LAN	Ethernet	1598	6.2 Mbps	463.8 kbps	
	ether2	Ethernet	1598	0 bps	0 bps	
R	ether3_FREE3	Ethernet	1598	337.6 kbps	3.2 Mbps	
R	ether4_FREE4	Ethernet	1598	339.9 kbps	3.2 Mbps	
	ether5	Ethernet	1598	0 bps	0 bps	
X	wlan1	Wireless (Atheros AR9...	1600	0 bps	0 bps	

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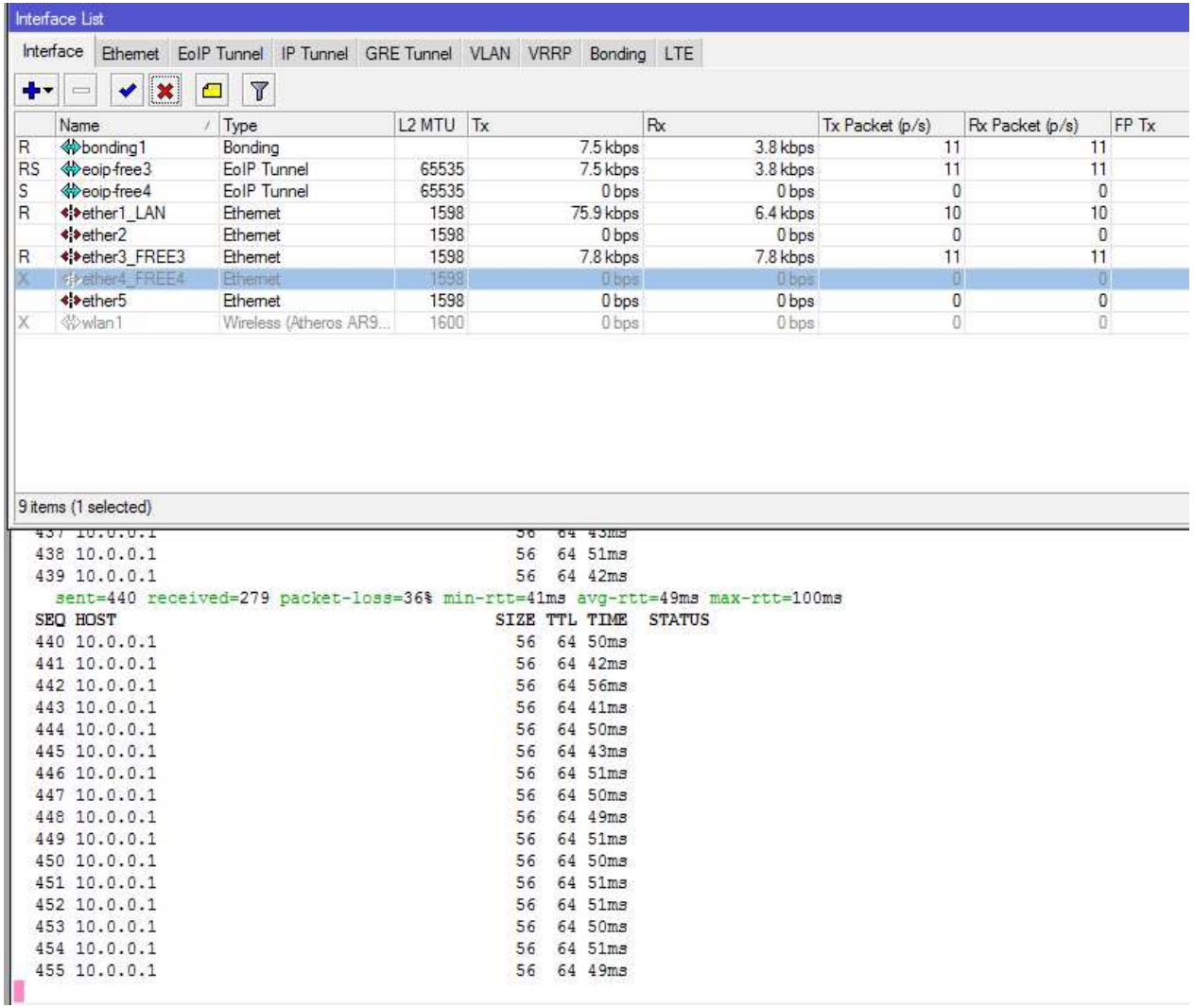
Mise en pratique #3 : ADSL

Test bonding / pannes



Mise en pratique #3 : ADSL

Limitations du « balance-rr » sur ADSL

- Nécessité d’avoir lignes ADSL équivalentes
- Perte de bande passante (tunnels) ~ 15 %
- Attention à l’ordre des paquets → retransmissions

Conclusion

- 3 cas de figure très différents (à la base)
- Richesse des fonctionnalités de RouterOS
- Solutions simples et élégantes

Questions

Merci pour votre attention

Le bonding avec Mikrotik

Benoît PHILIPPON
Wifispares / Atlanteam

MUM Paris 2016

wifispares

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