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MIKROTIK BONDING

By: Julián Páez P.

*Mikro***Tik**

SOBRE S3 SIMPLE SMART SPEEDY

Pertenecemos al sector de las tecnologías de la información y las comunicaciones en las áreas de conectividad, Mesa de Servicios, Data Center, Virtualización, Infraestructura y Servicios orientados hacia los modelos de transformación digital tendencia en el mercado.



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S3 Simple Smart Speedy S.A.S



S3 Simple Smart Speedy



@S3_Colombia

SOBRE MI...



- ❖ Julián Páez P, Bogotano, 37 años.
- ❖ Ingeniero de Telecomunicaciones.
- ❖ Evangelizador de Mikrotik desde 2011.
- ❖ Certificado en Mikrotik, Ubiquiti, Itil V.3, ISO 9001, etc.
- ❖ PARTNER DE YOUTUBE.(canal de tutoriales de Networking y Wireless)
- ❖ Emprendedor.



@julian_koeleth



<https://www.youtube.com/user/juliman800/videos>



<https://www.linkedin.com/in/julian-paez-prieto-68aaa3a2/>

QUE ES BONDING?

Es un driver que originalmente venía con los parches para clusters beowulf, desde hace un tiempo se puede implementar en un kernel 2.2X, 2.4X y 2.6x ¿Pero qué hace realmente?, ¿Para que sirve? Es la forma de tener dos INTERFACES de red funcionando como UNA sola y aprovechando el ancho de banda de las dos a la vez En definitiva con bonding (ip network multipathing) tendríamos dos tarjetas de red físicas y por encima una virtual que suministra el servicio.

El Bonding es una técnica que permite agregar varios interfaces de red físicos en uno único virtual. A cada interfaz físico se le denominará slave (esclavo). Con esto podemos realizar un balanceo de carga entre las dos interfaces y conseguir un ancho de banda final igual a la suma de los anchos de banda de cada slave.

Necesitamos al menos dos conexiones a internet para hacer bonding.



INTERFACE BONDING

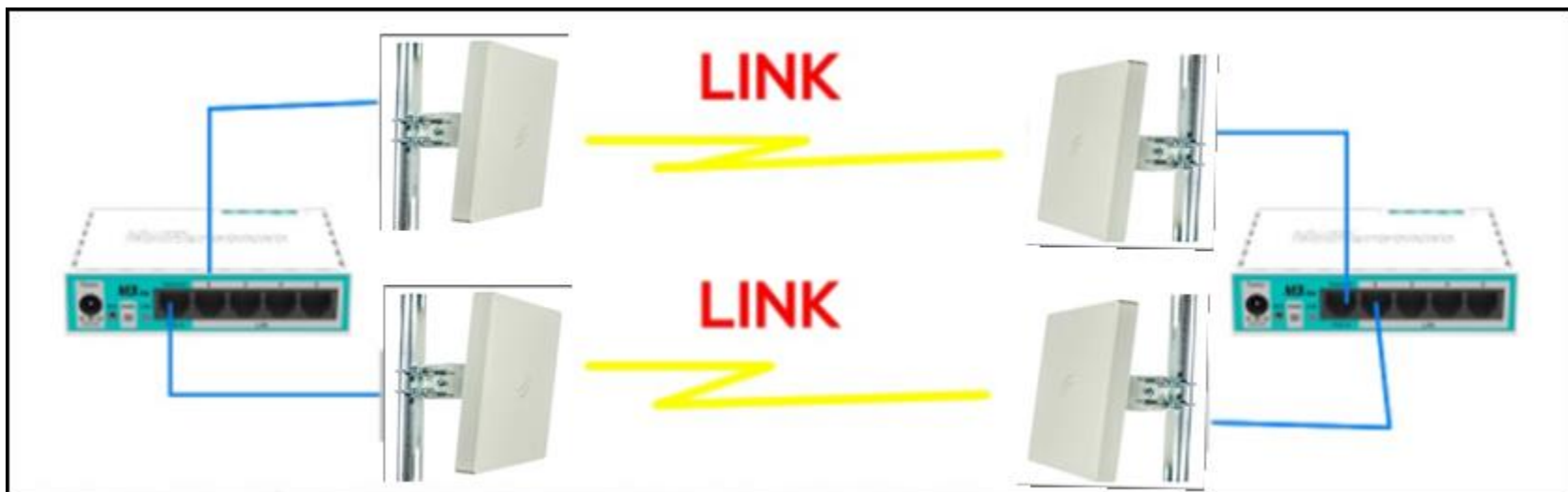
Trabajar con interfaces bonding de MikroTik nos proporciona:

Alta disponibilidad (HA), Mayor rendimiento de ancho de banda (throughput), debido a que se trabaja con interfaces redundantes las cuales dependiendo del modo en que lo configuremos podemos realizar trabajos de balanceo de carga, backup, entre otros.

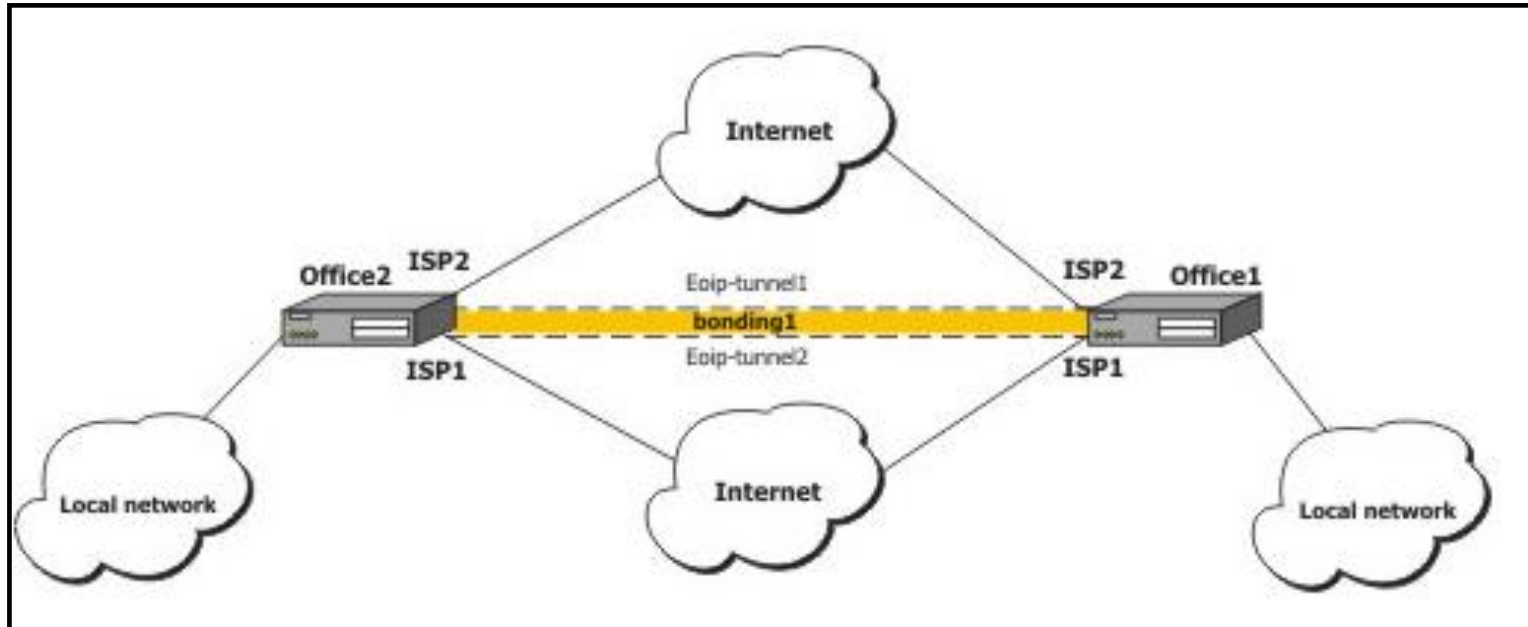
Estas interfaces se unen en capa 2 por lo general, también es posible unirlo en capa 3.



USOS DEL BONDING



USOS DEL BONDING

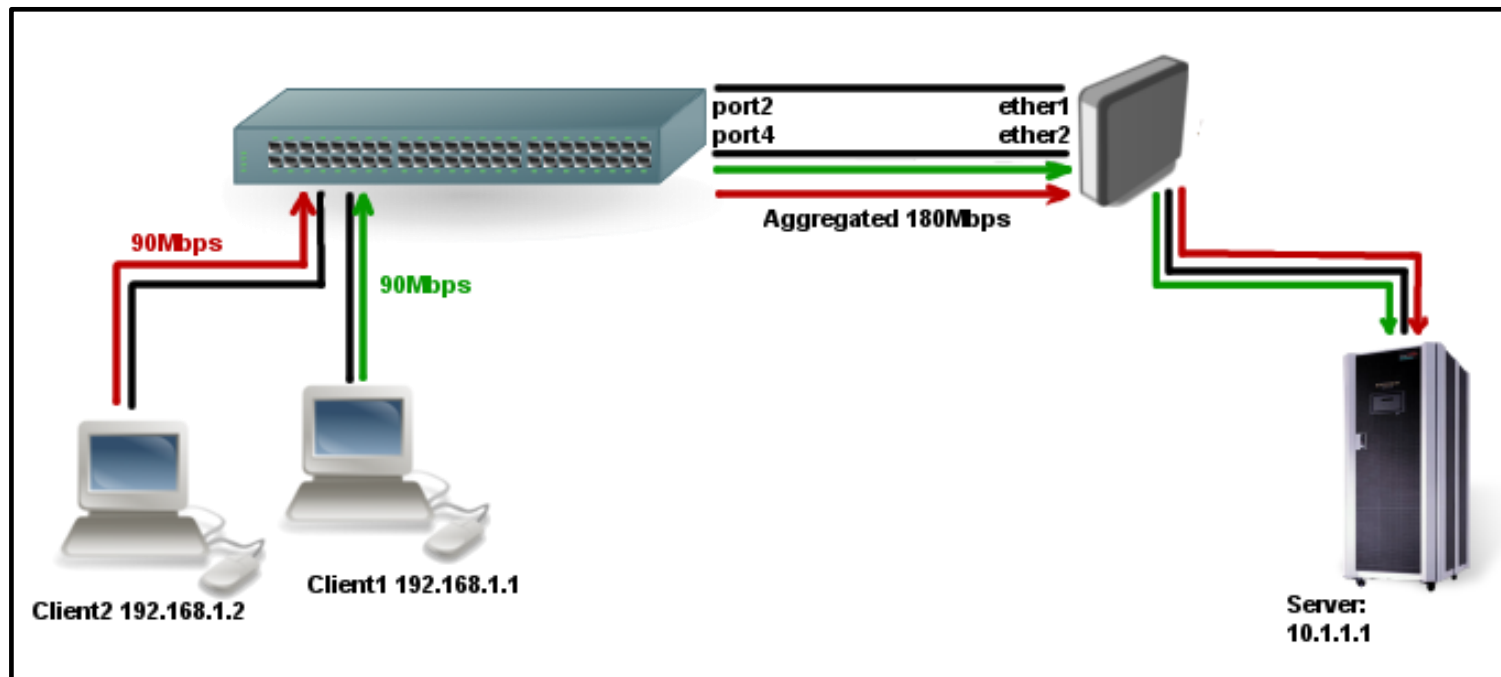


<https://www.youtube.com/watch?v=s6Fu46XSOWo>

USOS DEL BONDING



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USOS DEL BONDING



En el siguiente ejemplo crearemos una interface Bonding en modo de balanceo de carga (balance-rr) teniendo en cuenta que contamos interfaces Ethernet a 100Mbps las cuales sumarán sus velocidades en una interface virtual Bonding de 200Mbps.



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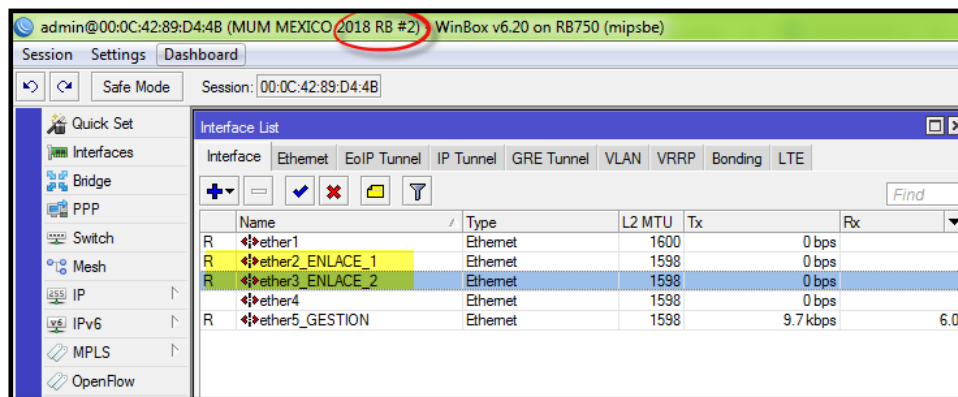
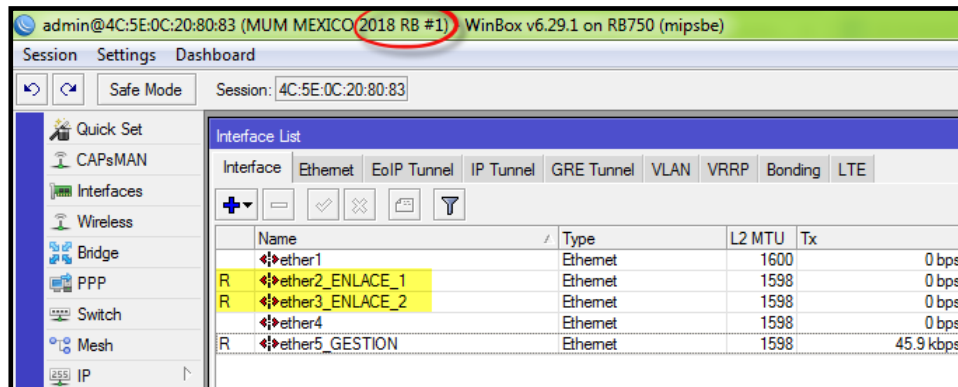


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MANOS A LA OBRA...

Creamos las interfaces que en este caso están enlazadas a través de un Switch. Esto para el router #1 y el #2

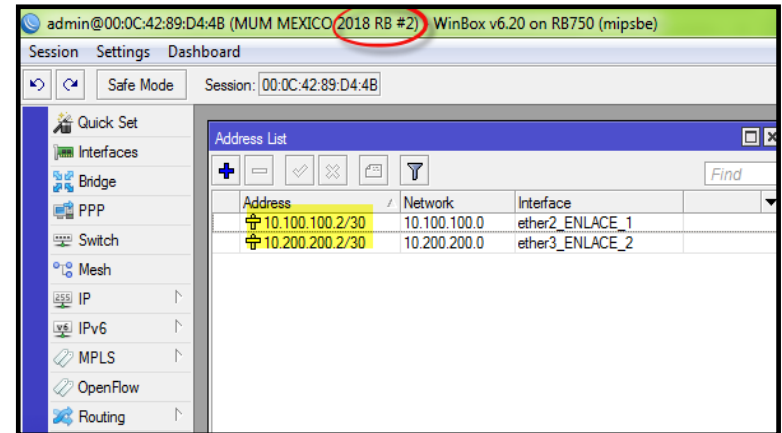
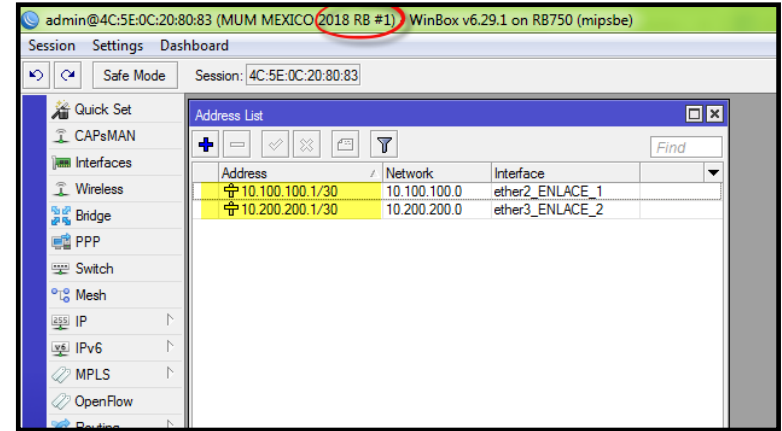
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Se crean y asignan los direccionamientos IP en el par de RouterBoard.

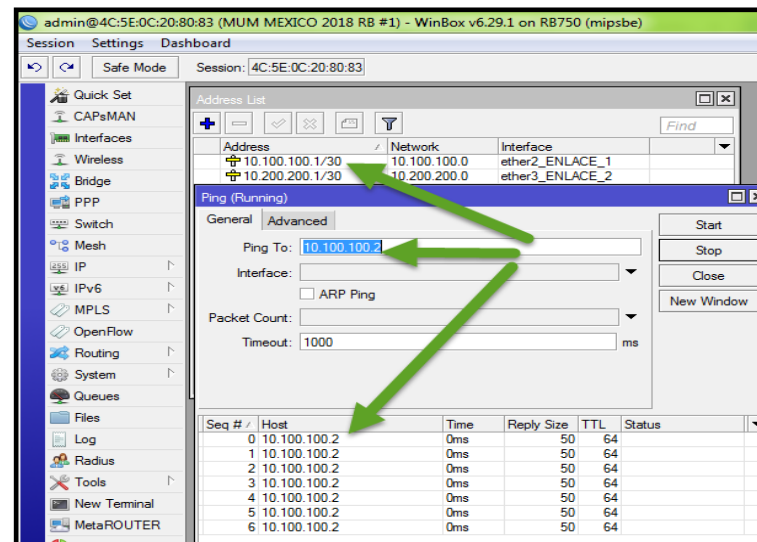
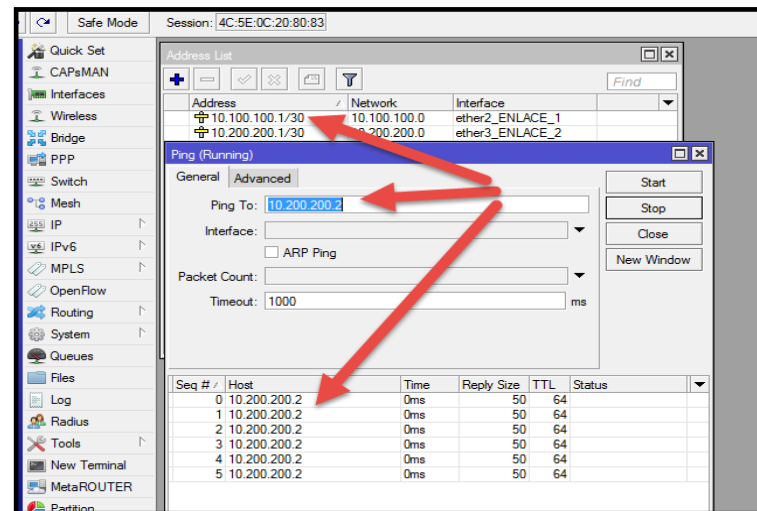
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Se hacen pruebas de ICMP,
Ping entre cada peer del
router #1

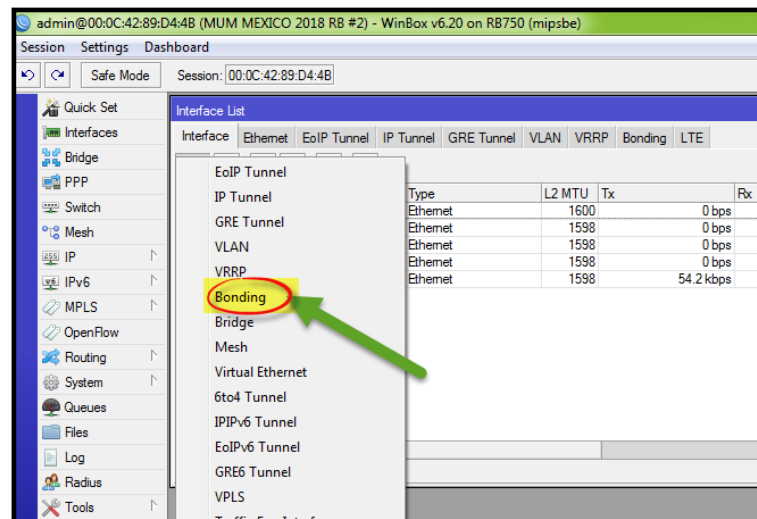
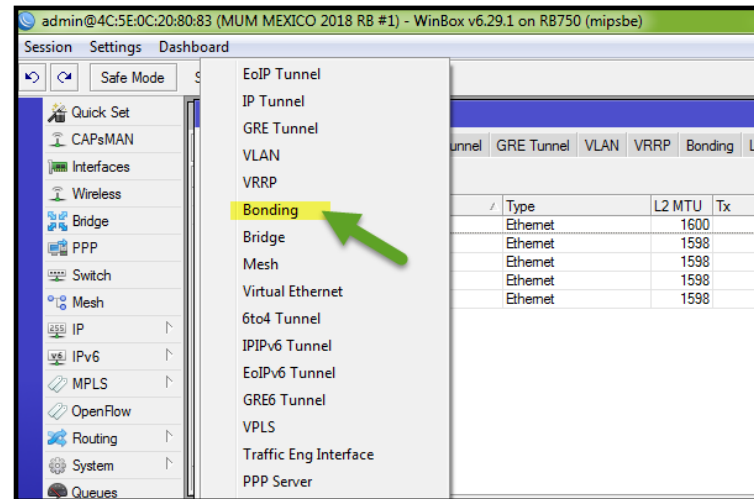
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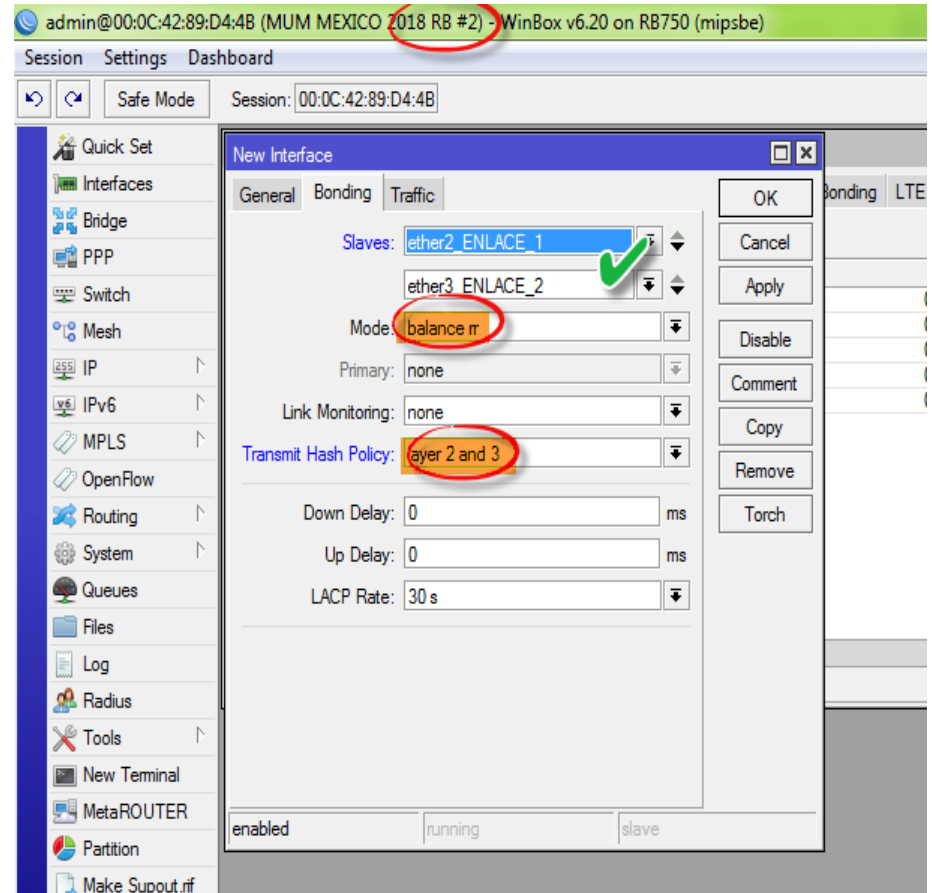
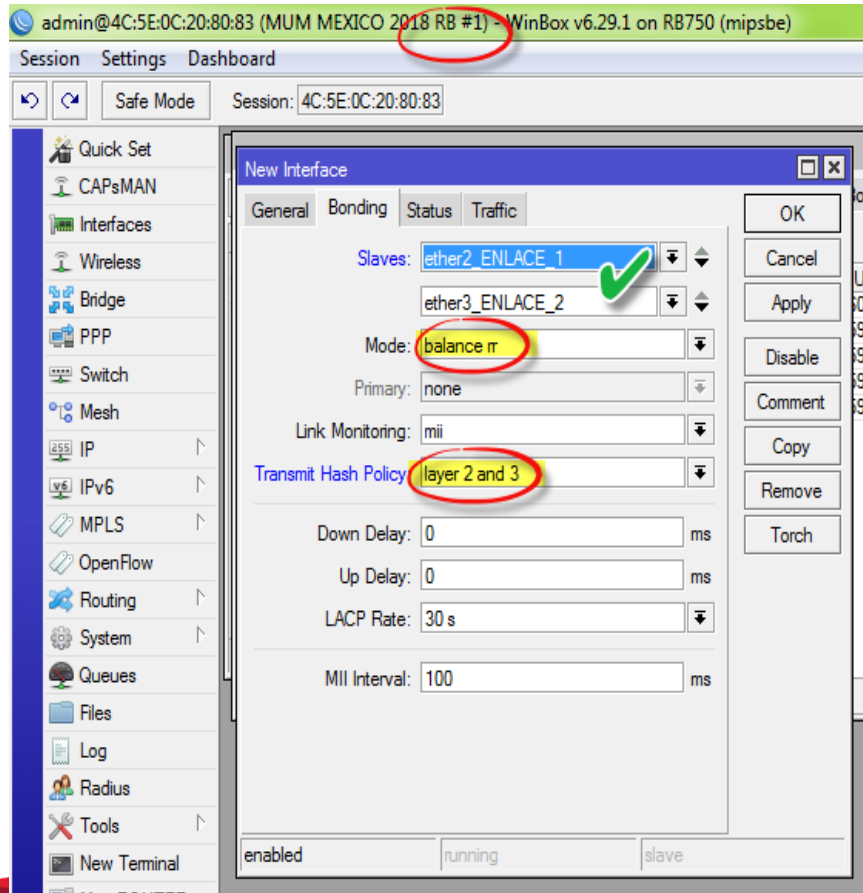


Creación de la interfaz virtual Bonding para el Router 1 y 2, ambos debe tener el protocolo creado.

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Asignamos al Bonding las dos interfaces “esclavas” Elegimos MODE: “balance rr” algoritmo Round Robin.



Balance Round Robin



En este modo, los paquetes se transmiten en orden secuencial desde el primer esclavo disponible hasta el último.

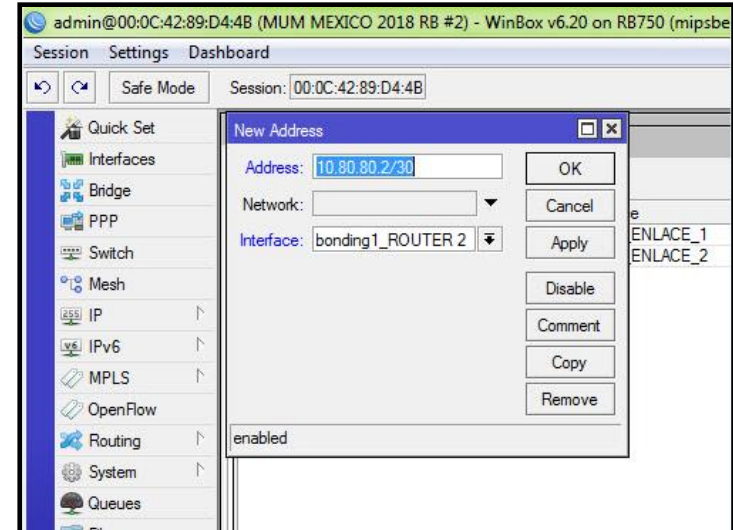
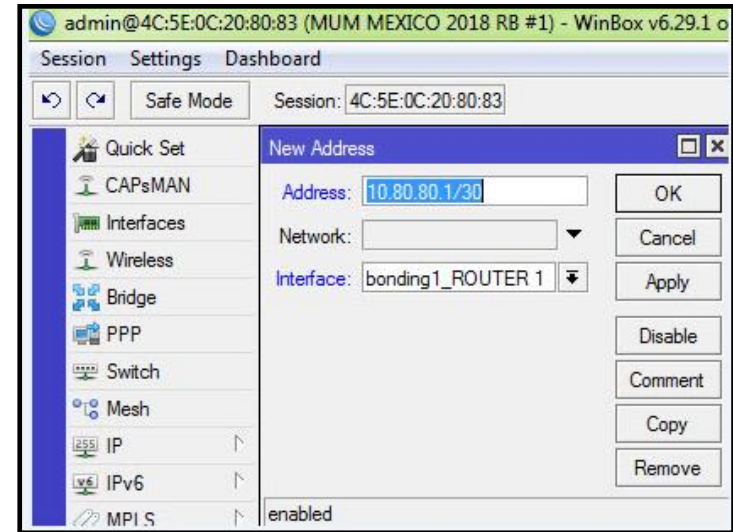
Balance-rr es el único modo que enviará paquetes a través de múltiples interfaces que pertenecen a la misma conexión TCP / IP.

Es útil para vincular varios enlaces inalámbricos, sin embargo, requiere igual ancho de banda para todos los enlaces enlazados.



Se asigna direccionamiento
a ambas interfaces virtuales
BONDING

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Session: 00:0C:42:89:D4:4B

Interface <ether2_ENLACE_1>

Ethernet Status Overall Stats Rx Stats Tx Stats ...

Auto Negotiation: done

Rate: 100Mbps

☒ Full Duplex

Advertising: 10M half

10M full

100M half

100M full

Link Partner Advertising: 10M half

10M full

100M half

100M full

OK

Cancel

Apply

Disable

Comment

Torch

Cable Test

Blink

Reset MAC Address

Reset Counters

Interface <ether3_ENLACE_2>

Ethernet Status Overall Stats Rx Stats Tx Stats ...

Auto Negotiation: done

Rate: 100Mbps

☒ Full Duplex

Advertising: 10M half

10M full

100M half

100M full

Link Partner Advertising: 10M half

10M full

100M half

100M full

OK

Cancel

Apply

Disable

Comment

Torch

Cable Test

Blink

Reset MAC Address

Reset Counters

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Bandwidth Test



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admin@4C-5E-0C:20:80:83 (MUM MEXICO 2018 RB #1) - WinBox v6.29.1 on RB750 (mipsbe)

Session Settings Dashboard

Safe Mode Session: 4C-5E-0C:20:80:83

Quick Set
CAPsMAN
Interfaces
Wireless
Bridge
PPP
Switch
Mesh
IP
IPv6
MPLS
OpenFlow
Routing
System
Queues
Files
Log
Radius
Tools
New Terminal
MetaROUTER
Partition
Make Spout.rtf
Manual
New WinBox
Exit

Interface List

Interface	Name	Type	L2 MTU	Tx	Rx
R	bonding1_ROUTER 1	Bonding			198.3 Mbps
	ether1	Ethernet	1600	0 bps	0 bps
RS	ether2_ENLACE_1	Ethernet	1598	560 bps	99.1 Mbps
RS	ether3_ENLACE_2	Ethernet	1598	656 bps	99.1 Mbps
	ether4	Ethernet	1598	0 bps	0 bps
R	ether5_GESTION	Ethernet	1598	56.0 kbps	10.8 kbps

6 items

Bandwidth Test (Running)

Test To: 10.80.80.2

Protocol: ☒ udp ☐ tcp

Local UDP Tx Size: 1500

Remote UDP Tx Size: 1500

Direction: receive

TCP Connection Count: 20

Local Tx Speed: bps

Remote Tx Speed: bps

☐ Random Data

User: admin

Password:

Lost Packets: 1646

Tx/Rx Current: 0 bps/194.4 Mbps

Tx/Rx 10s Average: 0 bps/194.4 Mbps

Tx/Rx Total Average: 0 bps/166.0 Mbps

running...

Legend: Tx: (blue square), Rx: (red square)

Graph showing Tx and Rx speeds over time. Rx speed is significantly higher than Tx speed.

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Bandwidth Test



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admin@4C:5E:0C:20:80:83 (MUM MEXICO 2018 R8 #1) - WinBox v6.29.1 on R8750 (mipsbe)

Session Settings Dashboard

Safe Mode Session: 4C:5E:0C:20:80:83

Quick Set CAPsMAN Interfaces Wireless Bridge PPP Switch Mesh IP IPv6 MPLS OpenFlow Routing System Queues Files Log Radius Tools New Terminal MetaROUTER Partition Make Supout.nf Manual New WinBox Exit

Interface List

Interface	Ethernet	EoIP Tunnel	IP Tunnel	GRE Tunnel	VLAN	VRRP	Bonding	LTE
Name	Type	L2 MTU	Tx	Rx				
R bonding1_ROUTER 1	Bonding	1600	196.9 Mbps	1200 bps				
R ether1	Ethernet	1598	0 bps	0 bps				
RS ether2_ENLACE_1	Ethernet	1598	98.4 Mbps	552 bps				
RS ether3_ENLACE_2	Ethernet	1598	98.4 Mbps	648 bps				
R ether4	Ethernet	1598	0 bps	0 bps				
R ether5_GESTION	Ethernet	1598	78.1 kbps	10.7 kbps				

6 items

Bandwidth Test (Running)

Test To: 10.80.80.2

Protocol: ☒ udp ☐ tcp

Local UDP Tx Size: 1500

Remote UDP Tx Size: 1500

Direction: send

TCP Connection Count: 20

Local Tx Speed: bps

Remote Tx Speed: bps

☐ Random Data

User: admin

Password:

Lost Packets: 0

Tx/Rx Current: 195.0 Mbps/0 bps

Tx/Rx 10s Average: 194.9 Mbps/0 bps

Tx/Rx Total Average: 158.3 Mbps/0 bps

running...

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Probando el FAILOVER



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admin@4C:5E:0C:20:80:83 (MUM MEXICO 2018 RB #1) - WinBox v6.29.1 on RB750 (mipsbe)

Session Settings Dashboard

Safe Mode Session: 4C:5E:0C:20:80:83

Interface List

Interface	Ethernet	EoIP Tunnel	IP Tunnel	GRE Tunnel	VLAN	VRRP	Bonding	LTE
Name	Type	L2 MTU	Tx	Rx				
R bonding1_ROUTER 1	Bonding	1600	99.4 Mbps	1216 bps				
ether1	Ethernet	1598	0 bps	0 bps				
ether2_ENLACE_1	Ethernet	1598	99.4 Mbps	656 bps				
ether3_ENLACE_2	Ethernet	1598	0 bps	560 bps				
ether4	Ethernet	1598	0 bps	0 bps				
ether5_GESTION	Ethernet	1598	78.6 kbps	10.8 kbps				

6 items (1 selected)

Bandwidth Test (Running)

Test To: 10.80.80.2

Protocol: ☒ udp ☐ tcp

Local UDP Tx Size: 1500

Remote UDP Tx Size: 1500

Direction: send

TCP Connection Count: 20

Local Tx Speed: bps

Remote Tx Speed: bps

☐ Random Data

User: admin

Password:

Lost Packets: 0

Tx/Rx Current: 97.5 Mbps/0 bps

Tx/Rx 10s Average: 97.4 Mbps/0 bps

Tx/Rx Total Average: 163.4 Mbps/0 bps

Tx: 97.5 Mbps

Rx:

running...

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Probando el FAILOVER



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admin@4C:5E:0C:20:80:83 (MUM MEXICO 2018 RB #1) - WinBox v6.29.1 on RB750 (mipsbe)

Session Settings Dashboard

Safe Mode Session: 4C:5E:0C:20:80:83

Quick Set CAPsMAN Interfaces Wireless Bridge PPP Switch Mesh IP IPv6 MPLS OpenFlow Routing System Queues Files Log Radius Tools New Terminal MetaROUTER Partition Make Supout.rtf Manual New WinBox Exit

Interface List

Interface	Ethernet	EoIP Tunnel	IP Tunnel	GRE Tunnel	VLAN	VRP	Bonding	LTE
Name	Type	L2 MTU	Tx	Rx				
R bonding1_ROUTER 1	Bonding		99.4 Mbps	3.1 kbps				
X ether1	Ethernet	1600	0 bps	0 bps				
ether2_ENLACE_1	Ethernet	1598	0 bps	1216 bps				
RS ether3_ENLACE_2	Ethernet	1598	99.4 Mbps	1968 bps				
ether4	Ethernet	1598	0 bps	0 bps				
R ether5_GESTION	Ethernet	1598	4.5 kbps	8.0 kbps				

6 items (1 selected)

Bandwidth Test (Running)

Test To: 10.80.80.2 Start Stop Close

Protocol: udp tcp

Local UDP Tx Size: 1500

Remote UDP Tx Size: 1500

Direction: send

TCP Connection Count: 20

Local Tx Speed: bps

Remote Tx Speed: bps

Random Data

User: admin

Password:

Lost Packets: 0

Tx/Rx Current: 97.4 Mbps/0 bps

Tx/Rx 10s Average: 95.4 Mbps/0 bps

Tx/Rx Total Average: 58.7 Mbps/0 bps

Tx: 97.4 Mbps Rx: 0 bps

running...

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Restablecemos Interfaces..



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admin@00:0C:42:89:D4:4B (MUM MEXICO 2018 RB #2) - WinBox v6.20 on RB750 (mipsbe)

Session Settings Dashboard

Safe Mode Session: 00:0C:42:89:D4:4B

Quick Set
Interfaces
Bridge
PPP
Switch
Mesh
IP
IPv6
MPLS
OpenFlow
Routing
System
Queues
Files
Log
Radius
Tools
New Terminal
MetaROUTER
Partition
Make Supout.rif
Manual
New WinBox
Exit

Interface List

Interface	Ethernet	EoIP Tunnel	IP Tunnel	GRE Tunnel	VLAN	VRRP	Bonding	LTE
Name	Type	L2 MTU	Tx	Rx	Tx Pa			
R bonding1_ROUTER 2	Bonding		12.16 kbps	198.4 Mbps				
R ether1	Ethernet	1600	0 bps	0 bps				
RS ether2_ENLACE_1	Ethernet	1598	560 bps	99.2 Mbps				
RS ether3_ENLACE_2	Ethernet	1598	656 bps	99.2 Mbps				
R ether4	Ethernet	1598	0 bps	0 bps				
R ether5_GESTION	Ethernet	1598	62.4 kbps	13.8 kbps				

Bandwidth Test (Running)

Test To: 10.80.80.1

Protocol: ☒ udp ☐ tcp

Local UDP Tx Size: 1500

Remote UDP Tx Size: 1500

Direction: receive

TCP Connection Count: 20

Local Tx Speed: bps

Remote Tx Speed: bps

☐ Random Data

User: admin

Password:

Lost Packets: 1950

Tx/Rx Current: 0 bps/194.8 Mbps

Tx/Rx 10s Average: 0 bps/194.7 Mbps

Tx/Rx Total Average: 0 bps/157.5 Mbps

running...

running...

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PREGUNTAS?



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