

# Tips para Principiantes

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- ❖ Consultora en Telecomunicaciones
- ❖ Establecida en 2008
- ❖ Certificada en **ISO 9001:2015**
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❖ Certificaciones Disponibles



powered by Mke Solutions

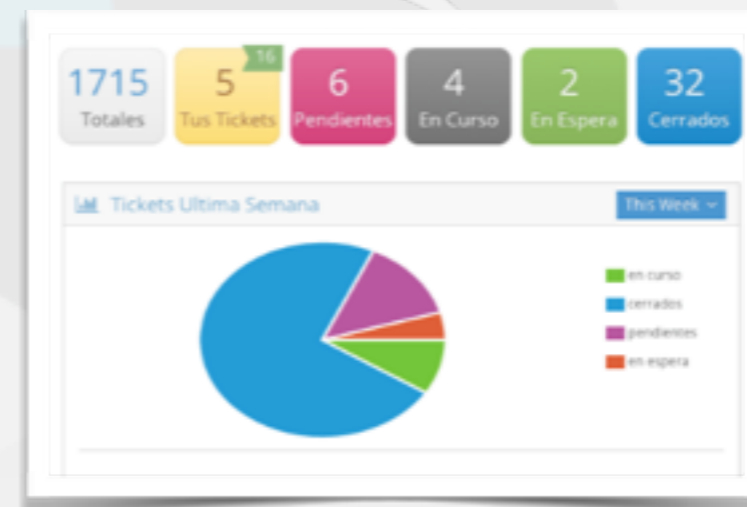
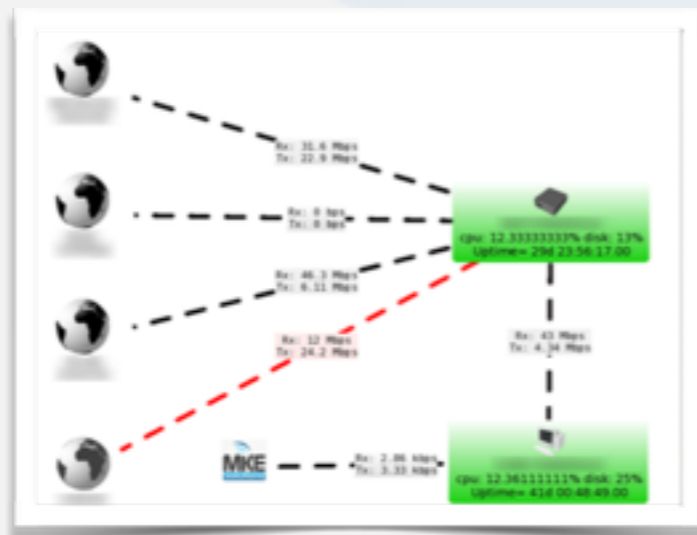


❖ Entrenamientos Públicos y Privados.

❖ ~300 alumnos por año, con un 75% de certificados.



- ❖ Diseño, desarrollo e implementación de soluciones.
- ❖ Incidencias puntuales.
- ❖ Soporte mensual (OutSourcing).
  - ❖ Revisión y Optimización
  - ❖ Actualización
  - ❖ Mantenimiento preventivo
  - ❖ Monitoreo
  - ❖ Asesoramiento
  - ❖ Soporte Prioritario
  - ❖ Guardia 24x7
  - ❖ Implementaciones Adicionales





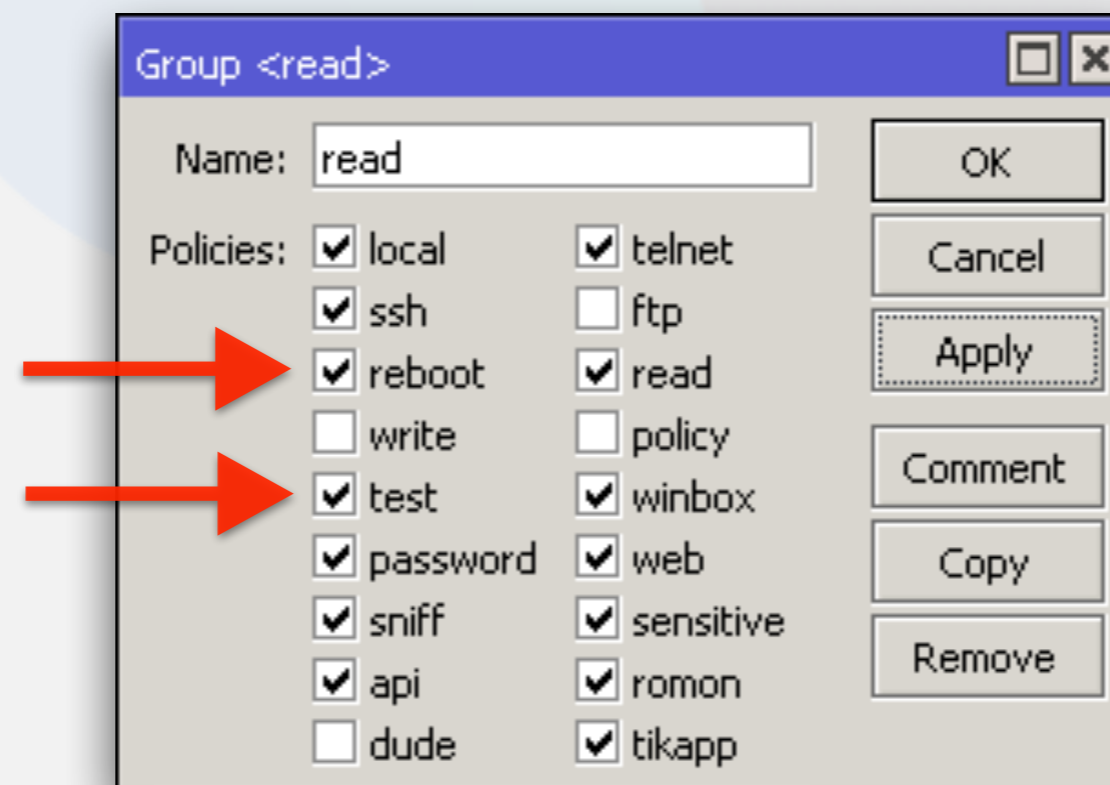
¿Quiénes somos principiantes?

**RouterOS** es una herramienta MUY poderosa y sobre todo demasiado amplia, pero como en todos los casos, hay que saber configurarlo correctamente.

- ❖ Mostrar los descuidos mas comunes que encuentro cuando los clientes solicitan un relevamiento.
- ❖ Demostrar que con “unos pocos clics” se pueden mejorar las configuraciones, incrementando la seguridad y reduciendo las posibles fallas.

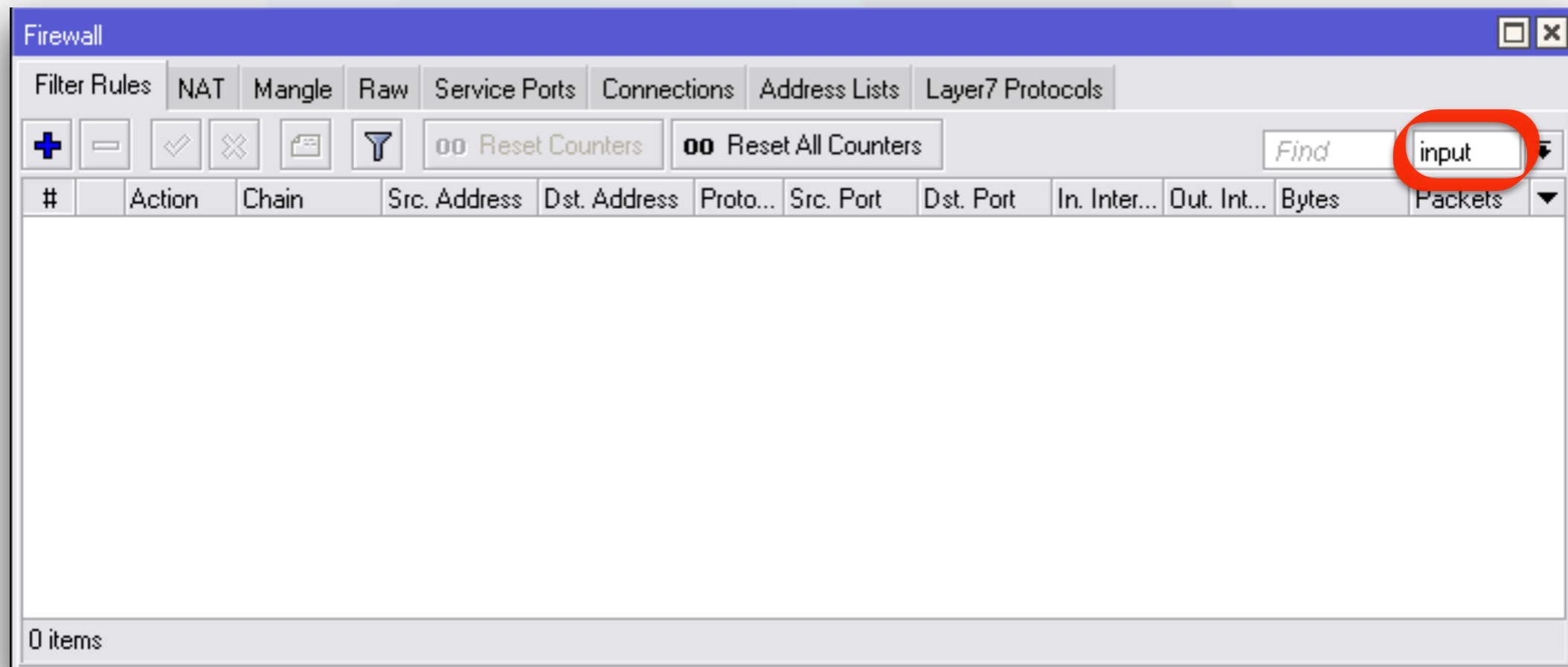


- ❖ Hay situaciones en las que se descuidan los accesos por default, dejando la puerta completamente abierta para ingresar al router con las credenciales por defecto.
- ❖ A veces, la única medida es poner el usuario admin en el perfil **read** y crear un nuevo usuario y contraseña con permisos FULL.
- ❖ *El grupo por defecto del usuario de sólo lectura tiene los permisos de REBOOT y TEST.*





- ❖ Una de las primeras acciones a realizar en todo equipo es poner al menos un pequeño firewall para prevenir los ataques más comunes.
- ❖ Los ataques tienen principalmente 2 objetivos: **tomar el control del router** o simplemente **provocarle una denegación de servicios** (CPU al 100%, consumo de todo el ancho de banda, etc).







Al no tener un firewall por defecto, todos los servicios están disponibles por todas sus interfaces, incluso la pública.

❖ **SSH** y **Telnet** son los más usados para conseguir acceso por fuerza bruta.

❖ **WEB** y **Winbox** son menos frecuentes, pero también ocurren.

all		
Jan/09/1970 23:08:56	system error critical	login failure for user identd from 187.141.13.251 via ssh
Jan/09/1970 23:08:59	system error critical	login failure for user gnats from 187.141.13.251 via ssh
Jan/09/1970 23:09:01	system error critical	login failure for user jeff from 187.141.13.251 via ssh
Jan/09/1970 23:09:04	system error critical	login failure for user irc from 187.141.13.251 via ssh
Jan/09/1970 23:09:09	system error critical	login failure for user list from 187.141.13.251 via ssh
Jan/09/1970 23:09:12	system error critical	login failure for user eleve from 187.141.13.251 via ssh
Jan/09/1970 23:09:16	system error critical	login failure for user proxy from 187.141.13.251 via ssh
Jan/09/1970 23:09:20	system error critical	login failure for user sys from 187.141.13.251 via ssh
Jan/09/1970 23:09:23	system error critical	login failure for user zzz from 187.141.13.251 via ssh
Jan/09/1970 23:09:27	system error critical	login failure for user tech from 187.141.13.251 via ssh
Jan/09/1970 23:09:30	system error critical	login failure for user frank from 187.141.13.251 via ssh



### DNS Settings

Servers: 8.8.8.8

Dynamic Servers: 192.168.10.1  
10.200.200.21

Allow Remote Requests

Max UDP Packet Size: 4096

Query Server Timeout: 2.000

Query Total Timeout: 10.000

Max. Concurrent Queries: 100

Max. Concurrent TCP Sessions: 20

Cache Size: 2048 K

Cache Max TTL: 7d 00:00:00

Cache Used: 10

### Torch (Running)

Interface: wan

Entry Timeout: 00:00:03 s

Filters

Src. Address: 0.0.0.0/0

Dst. Address: 0.0.0.0/0

Src. Address6: ::/0

Dst. Address6: ::/0

MAC Protocol: all

Protocol: any

Port: dns

VLAN Id: any

Et...	Prot...	Src.	Dst.	VLAN Id	Tx Rate	Rx Rate	Tx Pack...	Rx Pack
800 (ip)		115.238.184.126:12633	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		115.238.184.125:26701	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		115.238.184.126:43549	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		115.238.184.125:16379	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		101.71.74.109:17231	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		101.71.74.110:20153	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		115.238.184.125:50075	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		115.238.184.126:55531	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		115.238.184.126:62555	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		115.238.184.126:34379	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		115.238.184.126:48267	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		101.71.74.109:58126	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		101.71.74.110:24377	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		115.238.184.126:26973	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		115.238.184.126:43181	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		115.238.184.126:48380	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		101.71.74.109:14222	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		115.238.184.126:17981	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		115.238.184.125:49099	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		101.71.74.109:9467	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		101.71.74.109:42021	:53 (dns)		6.0 kbps	344 bps	0	
800 (ip)		101.71.74.109:62197	:53 (dns)		6.0 kbps	344 bps	0	

Total Tx: 724.7 kbps    Total Rx: 176.6 kbps    Total Tx Packet: 2    Total Rx Packet: 2



Google Sorry...

## We're sorry...

... but your computer or network may be sending automated queries. To protect our users, we can't process your request right now.

See [Google Help](#) for more information.

Para continuar, ingresa los siguientes caracteres:



### Acerca de esta página

Nuestros sistemas han detectado un tráfico inusual en tu red de equipo. Esta página verifica si realmente eres tú el que envía las solicitudes y no un robot. [¿Por qué sucedió esto?](#)

# Ataques por SNMP



Al habilitar el servicio de **SNMP**, por defecto el router queda expuesto a cualquier consulta por cualquiera de sus interfaces.

Profile (Running)

CPU:  Start Stop Close New Window

Name	CPU	Usage
dhcp	all	0.5
dns	all	0.5
firewall	all	9.5
idle	all	0.0
logging	all	0.5
snmp	all	55.5
p2p-match...	all	0.0
profiling	all	0.0
queuing	all	8.5
management	all	13.5
traffic-accounting	all	0.0

SNMP Community <public>

Name:

Addresses:

Security:

Read Access

Write Access

Authentication Protocol:

Encryption Protocol:

Authentication Password:

Encryption Password:

default

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- ❖ Una manera simple de protegerse, es deshabilitando los servicios que no se usen y proteger los demás con reglas de *firewall* o especificar el rango de direcciones IP desde la opción de *IP > Service*

Name	Port	Available From	Certificate
api	8728		
api-ssl	8729		none
ftp	21		
ssh	22		
telnet	23		
winbox	8291		
www	80		
X www-ssl	443		none

8 items

IP Service <ssh>

Name: ssh

Port: 22

Available From: [ ]

OK

Cancel

Apply

Disable

enabled



Tener deshabilitados todos los servicios no garantiza que el router esté 100% protegido.

- ❖ El protocolo **ICMP** mal usado, puede elevar el consumo del CPU y provocar denegación de servicio > **Ping Flooding**.

Name	Port	Available From
api	8728	
api-ssl	8729	
ftp	21	
ssh	22	
telnet	23	
winbox	8291	192.168.10.0/24
www	80	
www-ssl	443	

Name	Usage
networking	58.5
ethernet	26.5
bridging	6.5
profiling	3.5
unclassified	3.0
management	2.0
idle	0.0
logging	0.0
winbox	0.0



New Firewall Rule

General Advanced Extra Action Statistics

Chain: **input**

Src. Address:

Dst. Address:

Protocol:  6 (tcp)

Src. Port:

Dst. Port:

Any. Port:

P2P:

In. Interface:  Publica

- ❖ *SSH*: TCP 22
- ❖ *Telnet*: TCP 23
- ❖ *WEB*: TCP 80
- ❖ *Winbox*: TCP 8291
- ❖ *WebProxy*: TCP 8080
- ❖ *DNS*: UDP 53
- ❖ *SNMP*: UDP 161

New Firewall Rule

General Advanced Extra Action Statistics

Action: **drop**

Log

Log Prefix:



Firewall Rule <>

General Advanced **Extra** Action Statistics

▼ Connection Limit

▲ Limit

Rate:  10 / sec

Burst:

Mode:  packet  bit

Firewall

Filter Rules NAT Mangle Raw Service Ports Connections Address Lists Layer7 Protocols

+ - ✓ ✗

#	Action	Chain	Protocol	Limit/Rate	Bytes	Packets
0	✓ acc...	input	1 (icmp)	10/sec	11.6 KiB	142
1	✗ drop	input	1 (icmp)		98.7 KiB	1 203

```
/ip firewall filter
```

```
add action=accept chain=input limit=10,5:packet protocol=icmp
```

```
add action=drop chain=input protocol=icmp
```





- ❖ Bloquear en el router principal el tráfico de download que no vaya con destino a nuestras propias direcciones IP (forward).
- ❖ Bloquear en el router principal el tráfico de upload que no venga con destino desde nuestras propias IP (forward).
- ❖ En caso de dar IP publicas, bloquear (o limitar) los servicios mas vulnerables para evitar ataques de amplificación (DNS, NTP, SNMP).





<i>Puerto</i>	<i>Protocolo</i>	<i>Comentario</i>
20,21	TCP	FTP
22	TCP	SSH, SFTP
23	TCP	TELNET
53	TCP/UDP	DNS
80	TCP	HTTP
123	UDP	NTP
161,162	UDP	SNMP
179	TCP	BGP
443	TCP	HTTPS / (HotSpot)

<i>Puerto</i>	<i>Protocolo</i>	<i>Comentario</i>
2000	TCP	Bandwidth Server
3128,8080	TCP	WebProxy
5678	UDP	Neighbour Discovery
8291	TCP	WinBox
8728	TCP	API
	I	ICMP
1701	UDP	L2tP
1723	TCP	PPtP
1812,1813	UDP	User Manager



- ❖ No dejar el usuario “admin” del hotspot sin contraseña!

Hotspot Setup

Create local HotSpot user

Name of Local HotSpot User:

Password for the User:

Back Next Cancel

- ❖ El campo “shared-users” del perfil de hotspot permite que el mismo usuario pueda usarse en simultáneo N veces, pero cada uno tiene su propia queue!

Shared Users:

Rate Limit (rx/tx):

- ❖ El *bypass* oculta el hotspot, pero no controla el ancho de banda!

Hotspot IP Binding <192.168.10.15>

MAC Address:

Address:

To Address:

Server:

Type:



- ❖ *MNDP* está habilitado en todas sus interfaces.

MAC Address	IP Address	Identity	Version	Board
00:1C:42:53:CD:36	192.168.10.10	MikroTik	6.38 (stable)	x86
D4:CA:6D:88:E1:B7	192.168.10.211	Portero IP	6.36.3 (stable)	RBmAP2n
E4:8D:8C:0A:4E:37	192.168.10.1	Router Core by MKE Solutions	6.37.1 (stable)	RB3011UiAS

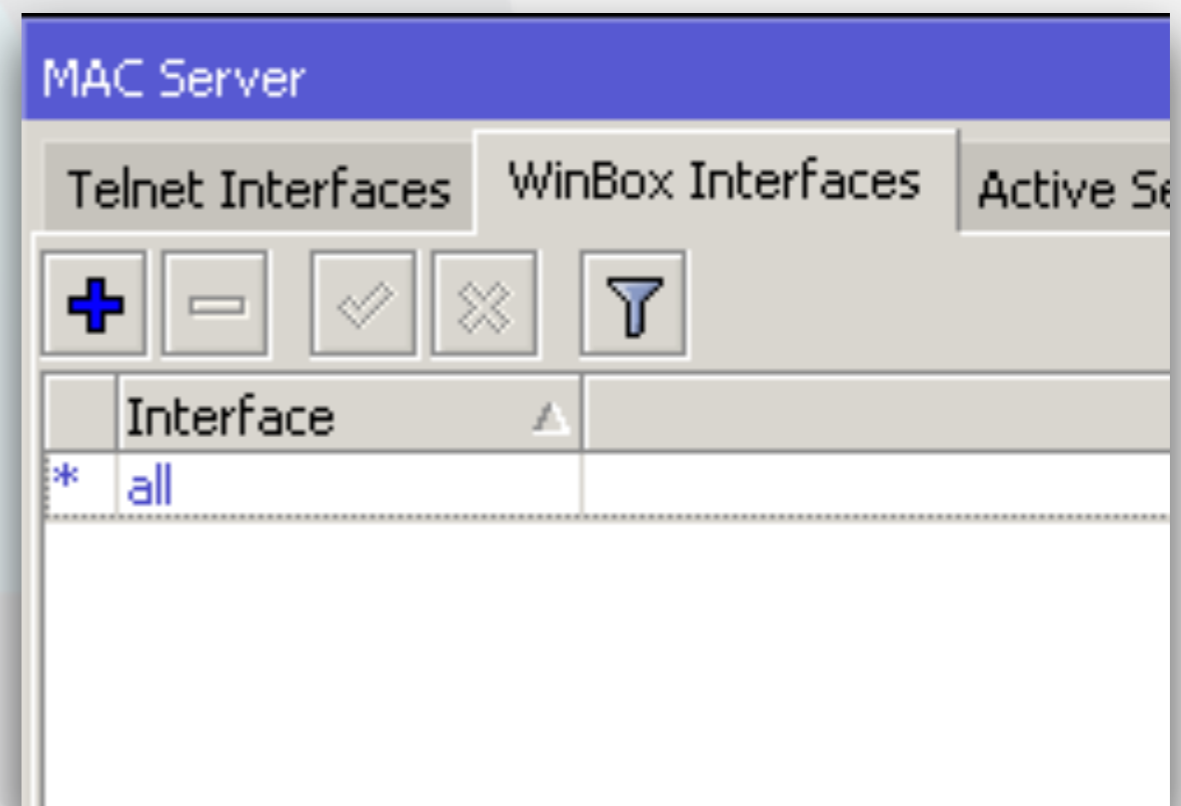
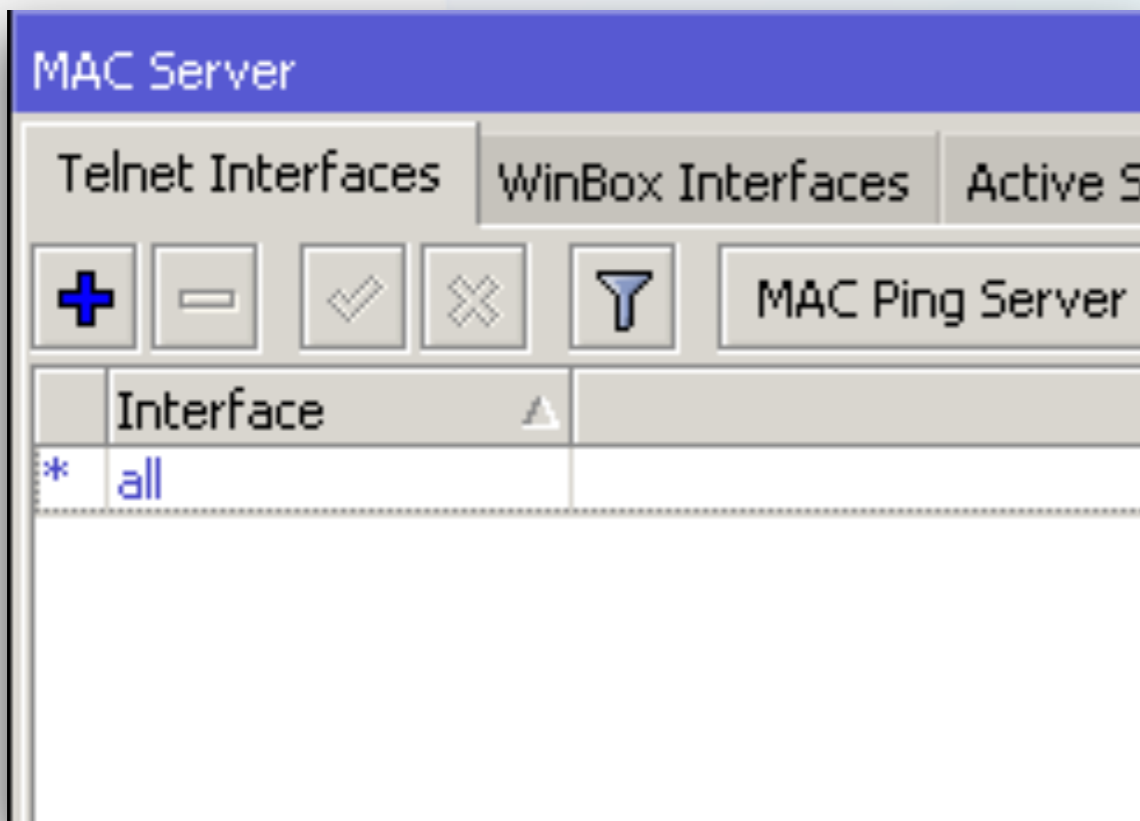
- ❖ *Ip > Neighbors*

Interface
Local
Publica
ether1
ether2
ether3
ether4
wlan1



Aún deshabilitando el “Discovery Interface” se puede acceder por *Mac-Telnet* y *Mac-Winbox* sabiendo la *MAC* del equipo.

- ❖ Para cerrar el acceso en capa 2: *Tools > Mac Server*



# mum Accesos guardados en Winbox



Si están guardados los accesos dentro del Winbox, fácilmente se puede exportar una lista y ver la contraseña con cualquier editor de texto!!!

The image shows two windows side-by-side. The left window is WinBox v3.7 (Addresses) with the 'Tools' menu open and 'Export...' selected. The right window is WordPad showing the exported text. Two entries are circled in red: 'pwdMUM-LAB' and 'pwdtest1'.

**WinBox v3.7 (Addresses) - Tools Menu:**

- Advanced Mode
- Import...
- Export...
- Move Sessions Folder...
- Clear Cache
- Check For Updates

**WinBox v3.7 (Addresses) - Managed:**

Address	User
192.168.10.11	admin
192.168.10.10	admin

**TEST - WordPad:**

```
group host 192.168.10.10
keep-pwd
loginadmin
note MikroTik
pwdMUM-LAB
secure-mode typeaddr group host 192.168.10.11
keep-pwd
loginadmin
note MikroTik
pwdtest1
secure-mode typeaddr
```



- ❖ En la versión 3, se puede setear un master password para que no muestre la lista y se pueda exportar.

The screenshot shows the WinBox v3.0rc17 (Addresses) window. The window title is "WinBox v3.0rc17 (Addresses)". The menu bar includes "File" and "Tools". The main area contains fields for "Connect To:" (192.168.88.1), "Login:" (Guille), and "Password:" (masked with asterisks). There are checkboxes for "Keep Password" (checked) and "Open In New Window" (unchecked). Below these are buttons for "Add/Set", "Connect To RoMON", and "Connect".

At the bottom, there are tabs for "Managed" and "Neighbors". A "Find" search bar is present with a dropdown menu set to "all". A red circle highlights a "Master Password" dialog box that is open, showing a "Password:" field and an "OK" button.

Address	User	Session	Group	RoMON Agent	No
---------	------	---------	-------	-------------	----



- ❖ NUNCA actualizar porque si.
- ❖ Leer changelog y las experiencias en el foro de MikroTik

Release 6.38

2017-01-02

What's new in 6.38 (2016-Dec-30 11:33):

Important note!!!

RouterOS v6.38 contains STP/RSTP changes which makes bridges compatible with IEEE 802.1Q-2014 by sending and processing BPDU packets without VLAN tag.

To avoid STP/RSTP compatibility issues with older RouterOS versions, upgrade RouterOS to v6.38 on all routers in Layer2 networks with VLAN and STP/RSTP configurations.

The recommended procedure is to start by upgrading the remotest routers and gradually do it to the Root Bridge device.

If after upgrade you experience loss of connectivity, then disabling STP/RSTP on RouterOS bridge interface will restore connectivity so you can complete upgrade process on your network.



v6.38 [current] is released!

Posted by **stroas**, Mon Jan 02, 2017 3:41 pm » in [Announcements](#)

14,526 views



159

**macgaiver**

Wed Jan 11, 2017 7:32 pm





- ❖ Usar filtros para evitar recibir publicaciones indeseadas (in).
- ❖ Usar filtros para evitar convertirse en tránsito (out).

BGP

Instances VRFs Peers Networks Aggregates VPN4 Routes Advertisements

+ - ✓ ✗ 📄 🗑️ Refresh Refresh All Resend Resend All

Name	Instance	Multihop	R...	TTL	Uptime	Prefix Count	State
🧩		yes	no	d...	2d 17:58..	632660	established
🧩		no	no	d...	3d 00:30..	631440	established
🧩		no	no	d...	11:06:33	273716	established

In Filter:

Out Filter:

Route Filters

+ - ✓ ✗ 📄 🗑️ Find all

#	Chain	Prefix	Prefix Length	Protocol	BGP AS
0 items					



- ❖ El uso de Nv2 ignora la configuración del **security-profile**.
- ❖ La configuración de la llave compartida se hace desde la solapa de Nv2.
- ❖ En caso de no usarse, cualquier **RouterOS** puede enlazarse.

Interface <wlan1>

General Wireless Data Rates Advanced HT HT MCS

Mode: **bridge**

Band: 5GHz-only-N

Channel Width: 20/40MHz Ce

Frequency: 6030

SSID: PEE

Radio Name: AP Euralis

Scan List: 4900-6100

Wireless Protocol: **nv2**

Security Profile:

Interface <wlan1>

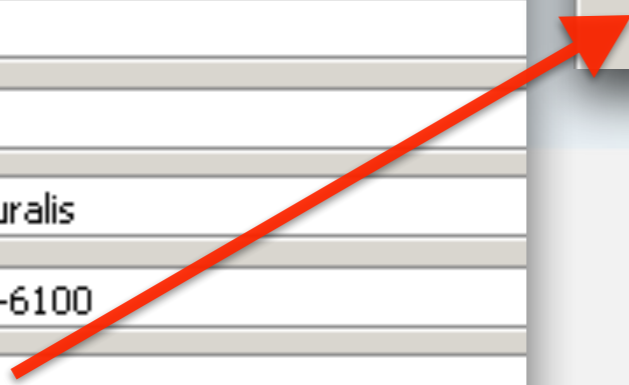
General Wireless Data Rates Advanced HT HT MCS WDS Nstreme **NV2**

TDMA Period Size: **2ms**

Cell Radius: 30

Security

Preshared Key: \*\*\*\*\*





Profile (Running)

Name	Usage
idle	76.5
winbox	6.5
management	4.5
networking	3.0
firewall	2.0
ppp	2.0
dns	1.5
queuing	1.5
ethernet	1.0
unclassified	1.0
logging	0.5
bridging	0.0
flash	0.0
graphing	0.0
l2tp	0.0
p2p-matcher	0.0
profiling	0.0
routing	0.0
ssl	0.0
traffic-accounting	0.0

Torch (Running)

Interface: wan

Entry Timeout: 00:00:03 s

Filters

Src. Address: 0.0.0.0/0

Dst. Address: 0.0.0.0/0

Src. Address6: ::/0

Dst. Address6: ::/0

MAC Protocol: all

Protocol: any

Port: any

VLAN Id: any

DSCP: any

Eth. ...	Pro...	Src.	Dst.	VLAN Id	DSCP	Tx Rate	Rx Rate	Tx Pack...	Rx Pack...
800 ...	6 (t...	184.107.141.20:9087				2.6 kbps	148.5 k...	5	14
806 ...						0 bps	39.8 kbps	0	83
800 ...	47	187.189.147.70				1760 bps	5.7 kbps	2	5
800 ...	6 (t...	64.233.186.125:5222				5.8 kbps	5.4 kbps	11	10
4 (8...						0 bps	1856 bps	0	2
800 ...	2 (i...	192.168.0.1			48	0 bps	1440 bps	0	3
800 ...	2 (i...	192.168.0.1			48	0 bps	1440 bps	0	3
800 ...	17 ...	8.8.4.4:53 (dns)				648 bps	1176 bps	1	1
800 ...	17 ...	190.104.143.50:1701 (l2tp)				928 bps	976 bps	2	2
800 ...	47	179.60.254.46				496 bps	976 bps	1	2
800 ...	1 (i...	8.8.8.8				944 bps	944 bps	1	1
800 ...	6 (t...	190.0.22.98:51241				592 bps	624 bps	1	1
800 ...	6 (t...	190.0.22.98:51893				592 bps	624 bps	1	1
800 ...	17 ...	64.233.186.189:443 (htt...				528 bps	600 bps	1	1
800 ...	6 (t...	179.41.15.50:44292				1184 bps	592 bps	2	1

191 items    Total Tx: 28.0 kbps    Total Rx: 222.0 kbps    Total Tx Packet: 50    Total Rx Packet: 152

Oct/30/2015 15:10:21	memory	system, info	changed snmp settings by admin
Oct/30/2015 15:27:05	memory	system, error, critical	login failure for user admin from 192.168.88.179 via winbox
Oct/30/2015 15:44:18	memory	system, info, account	user admin logged out from 192.168.10.4 via winbox
Oct/30/2015 15:47:11	memory	system, info, account	user admin logged in from 192.168.10.4 via winbox



❖ IP scan

❖ Packet Sniffer

❖ Mangle > TZCP

❖ Netflow / IPFIX / Port Mirror

❖ Add src / dst to address-list

IP Scan (Running)

Interface:

Address Range: 172.16.0.2

Address	MAC Address	Time (ms)	DNS
172.16.0.2	60:EB:69:B1:6E:32	17	
172.16.0.2	00:0C:42:8C:D2:D6	0	

2 items

New Mangle Rule

General Advanced Extra Action Statistics

Action: sniff TZSP

Log

Log Prefix:

Sniff Target: 0.0.0.0

Sniff Target Port: 0

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists

+ - ✓ ✗ 📄 🔍

Name	Address	Timeout
D ● Ataques SIP	66.240.192.138	00:22:22
D ● Ataques SIP	66.240.236.119	00:35:58
D ● Ataques SIP	71.6.135.131	00:31:02
D ● Ataques SIP	71.6.146.185	00:05:46
D ● Ataques SIP	71.6.158.166	00:32:01
D ● Ataques SIP	83.35.66.73	00:42:28
D ● Ataques SIP	134.119.215.49	00:06:11
D ● Ataques SIP	158.69.53.12	00:57:38



- ❖ Leer!
- ❖ Implementar
- ❖ Fallar
- ❖ Volver a Leer
- ❖ Corregir
- ❖ Testear
- ❖ Documentar!

## Main Page

### Welcome to the MikroTik Wiki!

This is a place where users of MikroTik solutions share information, examples, howtos and ideas with each other.

This resource consists of both User Maintained How-To articles, and also MikroTik maintained documentation pages.

Choose your category below:



#### MikroTik RouterOS

Documentation



#### RouterBOARD hardware

RouterBOARD hardware Pages



#### MikroTik User Manager

MikroTik User Manager



#### RouterOS User Topics

Articles and Examples written by users



#### MikroTik News

News and related information



#### MUM Events

MikroTik User Meetings around the world



#### The Dude

The Dude



#### SwOS

SwOS for MikroTik Switch products

RouterOS			
	<b>RouterOS v6 RC and v7 BETA</b> BETA Testing and Feature Suggestions for the next RouterOS release (ROS v7)	4,774 Topics	33,968 Posts
	<b>Beginner Basics</b> If you installed RouterOS just now, and don't know where to start - ask here!	16,447 Topics	74,272 Posts
	<b>General</b> RouterOS general discussion	47,440 Topics	231,382 Posts
	<b>Forwarding Protocols</b> BGP, OSPF, MPLS, MME, RIP, HWMPPplus	3,027 Topics	14,934 Posts
	<b>Wireless Networking</b> Wireless networks	13,050 Topics	73,915 Posts
	<b>Scripting</b> RouterOS Scripting and API	6,081 Topics	28,367 Posts
	<b>Virtualization</b> CHR, MetaRouter, KVM, Xen and other virtual systems that run RouterOS	457 Topics	4,290 Posts



# ¿Preguntas?

## MUCHAS GRACIAS!

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