

# BGP EN ROUTEROS v7

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# Sobre mi

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- ✓ Mario Clep
- ✓ Ingeniero en telecomunicaciones
- ✓ CTO MKE Solutions
- ✓ MikroTik Certified Trainer desde 2010.
- ✓ Experiencia desde 2005.



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# Sobre MKE Solutions

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- ✓ Consultoría en Telecomunicaciones.
- ✓ Capacitaciones / Entrenamientos Oficiales en MikroTik RouterOS.
- ✓ Implementaciones / Soporte a ISPs.
- ✓ Relevamiento y Optimización de redes.
- ✓ Desarrollo de software.



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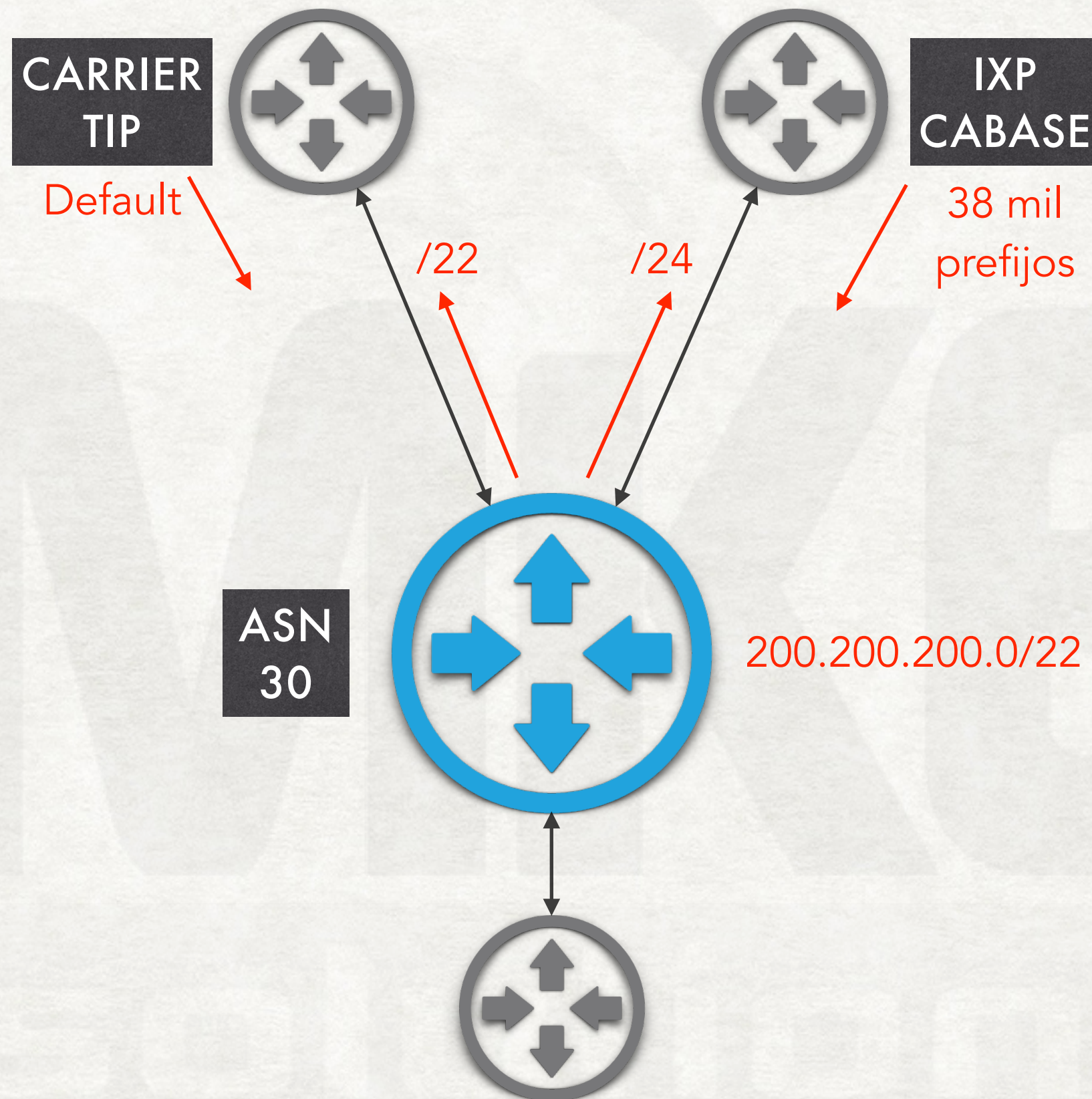


# Objetivos

---

- ✓ Configuración MINIMA de un router haciendo BGP contra TIP e IXP.
- ✓ Hacer un LABORATORIO EN VIVO mostrando el paso a paso.
- ✓ Analizar qué sucede en cada etapa de configuración de una sesión BGP en RouterOS v7.

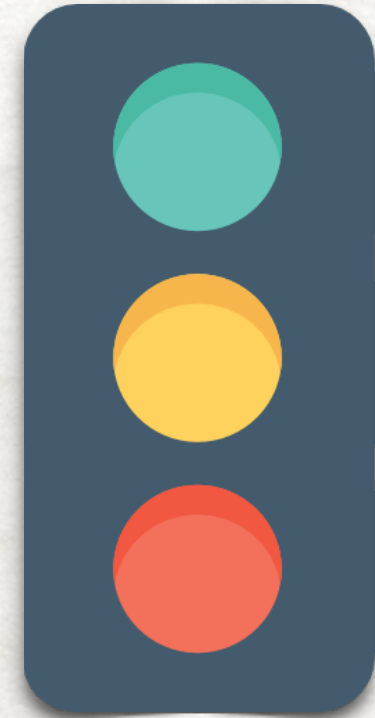
# Caso de estudio simplificado



# Pasos para la configuración de una sesión BGP en RouterOS

---

1. Configuración de capa 2 y capa 3 contra el equipo que se hará el BGP.
2. Crear una instancia de BGP\*.
3. Configurar cada sesión BGP.
4. Crear el address-list con las redes a originar.
5. Configurar los filtros in/out para cada sesión.
6. Verificar los prefijos anunciados y recibidos.



# Capa 2

/interface vlan

add interface=ether1 name="vlan10 - TIP" vlan-id=10

add interface=ether1 name="vlan20 - IXP" vlan-id=20

add interface=ether1 name="vlan30 - LAN" vlan-id=30

Interface List

Interface

Interface List

Ethernet

EoIP Tunnel

IP Tunnel

GRE Tunnel

VLAN

VXLAN

VRRP

VETH

MACsec

MACVLAN

Bonding

LTE

+

-

✓

✗

📁

🔍

|   | Name           | Type | VLAN ID | Interface | MTU  | Actual MTU | L2 MTU | Tx | Rx    | Tx Packet (p/s) | Rx Pack |
|---|----------------|------|---------|-----------|------|------------|--------|----|-------|-----------------|---------|
| R | 🔗 vlan10 - TIP | VLAN | 10      | ether1    | 1500 | 1500       |        |    | 0 bps | 0 bps           | 0       |
| R | 🔗 vlan20 - IXP | VLAN | 20      | ether1    | 1500 | 1500       |        |    | 0 bps | 0 bps           | 0       |
| R | 🔗 vlan30 - LAN | VLAN | 30      | ether1    | 1500 | 1500       |        |    | 0 bps | 0 bps           | 0       |

Interface <vlan10 - TIP>

Interface <vlan20 - IXP>

Interface <vlan30 - LAN>

General

Loop Protect

Status

Traffic

Name:

vlan10 - TIP

Type:

VLAN

MTU:

1500

Actual MTU:

1500

L2 MTU:

MAC Address:

00:1C:42:02:0D:92

ARP:

enabled

ARP Timeout:

VLAN ID:

10

Interface:

ether1

General

Loop Protect

Status

Traffic

Name:

vlan20 - IXP

Type:

VLAN

MTU:

1500

Actual MTU:

1500

L2 MTU:

MAC Address:

00:1C:42:02:0D:92

ARP:

enabled

ARP Timeout:

VLAN ID:

20

Interface:

ether1

General

Loop Protect

Status

Traffic

Name:

vlan30 - LAN

Type:

VLAN

MTU:

1500

Actual MTU:

1500

L2 MTU:

MAC Address:

00:1C:42:02:0D:92

ARP:

enabled

ARP Timeout:

VLAN ID:

30

Interface:

ether1

OK

Cancel

Apply

Disable

Comment

Copy

Remove

Torch

Reset Traffic Counters

# Capa 3

/ip address

add address=10.0.10.2/30 interface="vlan10 - TIP"

add address=10.0.20.2/30 interface="vlan20 - IXP"

add address=10.0.30.2/30 interface="vlan30 - LAN"

Address List

Find

|  | Address      | Network   | Interface    |
|--|--------------|-----------|--------------|
|  | 10.0.10.2/30 | 10.0.10.0 | vlan10 - TIP |
|  | 10.0.20.2/30 | 10.0.20.0 | vlan20 - IXP |
|  | 10.0.30.2/30 | 10.0.30.0 | vlan30 - LAN |

Address <10.0.10.2/30>

Address <10.0.20.2/30>

Address <10.0.30.2/30>

Address: 10.0.10.2/30

Network: 10.0.10.0

Interface: vlan10 - TIP

Address: 10.0.20.2/30

Network: 10.0.20.0

Interface: vlan20 - IXP

Address: 10.0.30.2/30

Network: 10.0.30.0

Interface: vlan30 - LAN

OK

Cancel

Apply

Disable

Comment

# Instancia

✓ Parámetro introducido en la versión v7.20.

✓ Routing → BGP → Instances

The screenshot shows the BGP configuration interface. At the top, there's a 'BGP' header and a tabbed menu with 'Connection', 'Templates', 'Instances', 'Sessions', and 'VPN'. Below the tabs are several icons: a plus sign, a minus sign, a checkmark, a cross, and a funnel. A table lists BGP instances with columns for Name, Routing Table, AS, and Router ID. The first row shows 'default' as the Name, 'main' as the Routing Table, and '30' as the AS. Below this, a configuration window titled 'Instance <default>' is open. It contains fields for Name (default), Routing Table (main, circled in red), VRF, Router ID, AS (30, circled in red), Cluster ID, and Ignore AS Path. On the right side of the window are buttons for OK, Cancel, Apply, Disable, Copy, and Remove. At the bottom left of the window, there's a checkbox labeled 'enabled' which is checked.

| Name    | Routing Table | AS | Router ID |
|---------|---------------|----|-----------|
| default | main          | 30 |           |

Instance <default>

Name: default

Routing Table: main

VRF:

Router ID:

AS: 30

Cluster ID:

Ignore AS Path:

enabled

OK  
Cancel  
Apply  
Disable  
Copy  
Remove

✓ Routing Table: nombre de la tabla de enrutamiento donde se instalarán los prefijos aprendidos por BGP.

✓ AS: Sistema autónomo propio.

/routing bgp instance

add as=30 name=default routing-table=main

# Sesión TIP

| BGP        |      |           |           |          |           |                |           |           |            |          |        |         |        |
|------------|------|-----------|-----------|----------|-----------|----------------|-----------|-----------|------------|----------|--------|---------|--------|
| Connection |      | Templates | Instances | Sessions | VPN       |                |           |           |            |          |        |         |        |
|            |      |           |           |          |           |                |           |           |            |          |        |         |        |
|            | Name | Template  | AS        | AFI      | Router ID | Remote Address | Remote... | Remote AS | Local Role | Multihop | Tx TTL | Connect | Listen |
|            | IXP  |           | 30        |          |           | 10.0.20.1/32   |           | 20        | ebgp       |          |        |         |        |
|            | TIP  |           | 30        |          |           | 10.0.10.1/32   |           | 10        | ebgp       |          |        |         |        |

BGP Connection <TIP>

General Extra Attributes Filter

Name: TIP

Instance: default

Template:

AS: 30 /

AFI:

Router ID:

Remote Address: 10.0.10.1/32

Remote Port:

Remote AS: 10

Remote Allow AS:

Local Address:

Local Port:

Local Role: ebgp

TCP MD5 Key:

BGP Connection <TIP>

General Extra Attributes Filter

Input Filter: tip-in

Input Accept NLRI:

Input Accept Communities:

Input Accept Ext Communities:

Input Accept Large Communities:

Input Filter Communities:

Input Filter Ext Communities:

Input Filter Large Communities:

Input Filter Unknown:

Output Filter: tip-out

Output Selection Policy:

Output Network: BGP-NETWORKS

OK

Cancel

Apply

Disable

Comment

Copy

Remove

# Sesión IXP

BGP

Connection

Templates

Instances

Sessions

VPN

+

−

✓

✕

|  | Name | Template | AS | AFI | Router ID | Remote Address | Remote... | Remote AS | Local Role | Multihop | Tx TTL | Connect | Listen |
|--|------|----------|----|-----|-----------|----------------|-----------|-----------|------------|----------|--------|---------|--------|
|  | IXP  |          | 30 |     |           | 10.0.20.1/32   |           | 20        | ebgp       |          |        |         |        |
|  | TIP  |          | 30 |     |           | 10.0.10.1/32   |           | 10        | ebgp       |          |        |         |        |

BGP Connection <IXP>

General Extra Attributes Filter

Name: IXP

Instance: default

Template:

AS: 30 /

AFI:

Router ID:

Remote Address: 10.0.20.1/32

Remote Port:

Remote AS: 20

Remote Allow AS:

Local Address:

Local Port:

Local Role: ebgp

TCP MD5 Key:

BGP Connection <IXP>

General Extra Attributes Filter

Input Filter: ixp-in

Input Accept NLRI:

Input Accept Communities:

Input Accept Ext Communities:

Input Accept Large Communities:

Input Filter Communities:

Input Filter Ext Communities:

Input Filter Large Communities:

Input Filter Unknown:

Output Filter: ixp-out

Output Selection Policy:

Output Network: BGP-NETWORKS

OK

Cancel

Apply

Disable

Comment

Copy

Remove

# Chequeo de la sesión

- ✓ Chequeo del estado de la sesión de BGP.
- ✓ /routing bgp instance print

| BGP                                         |              |          |                |           |           |               |                |               |         |  |
|---------------------------------------------|--------------|----------|----------------|-----------|-----------|---------------|----------------|---------------|---------|--|
| Connection Templates Instances Sessions VPN |              |          |                |           |           |               |                |               |         |  |
| Resend Refresh Stop Clear Dump Adv.         |              |          |                |           |           |               |                |               |         |  |
| Name                                        | Prefix Count | Uptime   | Remote Addr... | Remote AS | Remote... | Remote ID     | Remote Capa... | Local Address | Local A |  |
| E IXP-1                                     | 200          | 00:05:38 | 10.0.20.1      | 20        | ip        | 8.8.8.8       | mp rr as4      | 10.0.20.2     | ip      |  |
| E TIP-1                                     | 1            | 00:05:38 | 10.0.10.1      | 10        | ip        | 100.100.100.1 | mp rr as4      | 10.0.10.2     | ip      |  |

BGP Session <IXP-1>

General Remote Local Attributes Filter Stats

Name: IXP-1

Prefix Count: 200

Instance: default

Uptime: 00:05:47

OK

Resend

Refresh

Stop

Clear

Dump Adv.

established

BGP Session <TIP-1>

General Remote Local Attributes Filter Stats

Name: TIP-1

Prefix Count: 1

Instance: default

Uptime: 00:05:47

established

# Chequeo de los prefijos

| Route List                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |              |           |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------|----------|
|       |              |           |          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Dst. Address | Gateway   | Distance |
| DFbl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.0.0.0/0    | 10.0.10.1 | 20       |
| DFbl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.1.1.1/32   | 10.0.20.1 | 20       |
| DFbl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.1.1.2/32   | 10.0.20.1 | 20       |
| DFbl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.1.1.3/32   | 10.0.20.1 | 20       |
| DFbl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.1.1.4/32   | 10.0.20.1 | 20       |
| DFbl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.1.1.5/32   | 10.0.20.1 | 20       |
| DFbl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.1.1.6/32   | 10.0.20.1 | 20       |
| DFbl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.1.1.7/32   | 10.0.20.1 | 20       |
| DFbl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.1.1.8/32   | 10.0.20.1 | 20       |
| DFbl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.1.1.9/32   | 10.0.20.1 | 20       |
| DFbl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.1.1.10/32  | 10.0.20.1 | 20       |

Route <1.1.1.5/32->10.0.20.1>

General

Status

BGP

MPLS

Dst. Address: 1.1.1.5/32

Gateway: 10.0.20.1

Immediate Gateway: 10.0.20.1%vlan20 - IXP

Local Address:

Check Gateway:

☐ Suppress Hw Offload

Distance: 20

Scope: 40

Target Scope: 10

VRF Interface:

Routing Table: main

Pref. Source:

☐ Blackhole

dynamic

filtered

BGP

Hw Offloa...

ECMP

inactive

OK

Copy

Remove

```
[admin@R1LAB-BGP] > ip route/print where bgp
[admin@R1LAB-BGP] > routing/bgp/advertisements/print
[admin@R1LAB-BGP] >
```

Prefijos aprendidos

Prefijos anunciados

# Address-List

- ✓ Es necesario crear una lista con los prefijos a *originar*.
- ✓ IP → Firewall → Address Lists / IPv6 → Firewall → Address Lists

Output Filter:  ▲▼

Output Selection Policy:

Output Network:  ▲▼

| Firewall                                                            |                |                  |         |
|---------------------------------------------------------------------|----------------|------------------|---------|
| Filter Rules NAT Mangle Raw Service Ports Connections Address Lists |                |                  |         |
| + - ✓ ✗ [icon] [icon]                                               |                |                  |         |
|                                                                     | List           | Address          | Timeout |
|                                                                     | ● BGP-NETWORKS | 200.200.200.0/22 |         |
|                                                                     | ● BGP-NETWORKS | 200.200.200.0/24 |         |
|                                                                     | ● BGP-NETWORKS | 200.200.201.0/24 |         |
|                                                                     | ● BGP-NETWORKS | 200.200.202.0/24 |         |
|                                                                     | ● BGP-NETWORKS | 200.200.203.0/24 |         |

- ✓ En v7 el *synchronize es mandatorio* → es necesario tener una ruta *instalada y activa* para que los prefijos se puedan anunciar.

| Route List            |                    |           |                  |
|-----------------------|--------------------|-----------|------------------|
| + - ✓ ✗ [icon] [icon] |                    |           |                  |
| Dst. Address          |                    | in        | 200.200.200.0/22 |
|                       | Dst. Address       | Gateway   | Distance         |
| AS                    | ▶ 200.200.200.0/22 | 10.0.30.1 | 1                |
| AS                    | ▶ 200.200.200.0/24 | 10.0.30.1 | 1                |
| AS                    | ▶ 200.200.201.0/24 | 10.0.30.1 | 1                |
| AS                    | ▶ 200.200.202.0/24 | 10.0.30.1 | 1                |
| AS                    | ▶ 200.200.203.0/24 | 10.0.30.1 | 1                |

# Filtros

---

- ✓ Funcionan similar a las reglas de Firewall.
- ✓ Se cumplen en orden jerárquico.
- ✓ Formato tipo script. *"if (condición) {acción;}"*
- ✓ Acción por default → *reject* → Siempre que haya un filtro seleccionado para cada sesión, si no hay match, por defecto se rechaza.
- ✓ Filtros IN, impactan en los prefijos recibidos → Tráfico de UP.
- ✓ Filtros OUT, impactan en los prefijos anunciados → Tráfico de DOWN.

# Filtros IN

Route Filters

Rule Select Rule Num Set Community Set Community Ext Set Community Large Set

+ - ✓ ✗ [icon] Filter Wizard Find all

Chain contains in + - Filter

| # | Chain  | Rule                            |
|---|--------|---------------------------------|
| 2 | ixp-in | accept;                         |
| 5 | tip-in | if (dst == 0.0.0.0/0) {accept;} |
| 6 | tip-in | reject;                         |

3 items out of 7

Routing Filter Rule

Chain: ixp-in

Rule:

```
accept;
```

Routing Filter Rule

Chain: tip-in

Rule:

```
if (dst == 0.0.0.0/0) {  
  accept;  
}
```

Routing Filter Rule

Chain: tip-in

Rule:

```
reject;
```

# Filtros OUT

Route Filters

Rule

Select Rule

Num Set

Community Set

Community Ext Set

Community Large Set

Filter Wizard

Find

all

Chain

contains

out

Filter

| # | Chain   | Rule                                                    |  |
|---|---------|---------------------------------------------------------|--|
| 0 | ixp-out | if (dst in 200.200.200.0/22 && dst-len == 24) {accept;} |  |
| 1 | ixp-out | reject;                                                 |  |
| 3 | tip-out | if (dst == 200.200.200.0/22) {accept;}                  |  |
| 4 | tip-out | reject;                                                 |  |

## Routing Filter Rule

Chain:

Rule:

```
if (dst in 200.200.200.0/22 && dst-len == 24) {  
accept;  
}
```

## Routing Filter Rule

Chain:

Rule:

```
if (dst == 200.200.200.0/22) {  
accept;  
}
```

## Routing Filter Rule

Chain:

Rule:

```
reject;
```

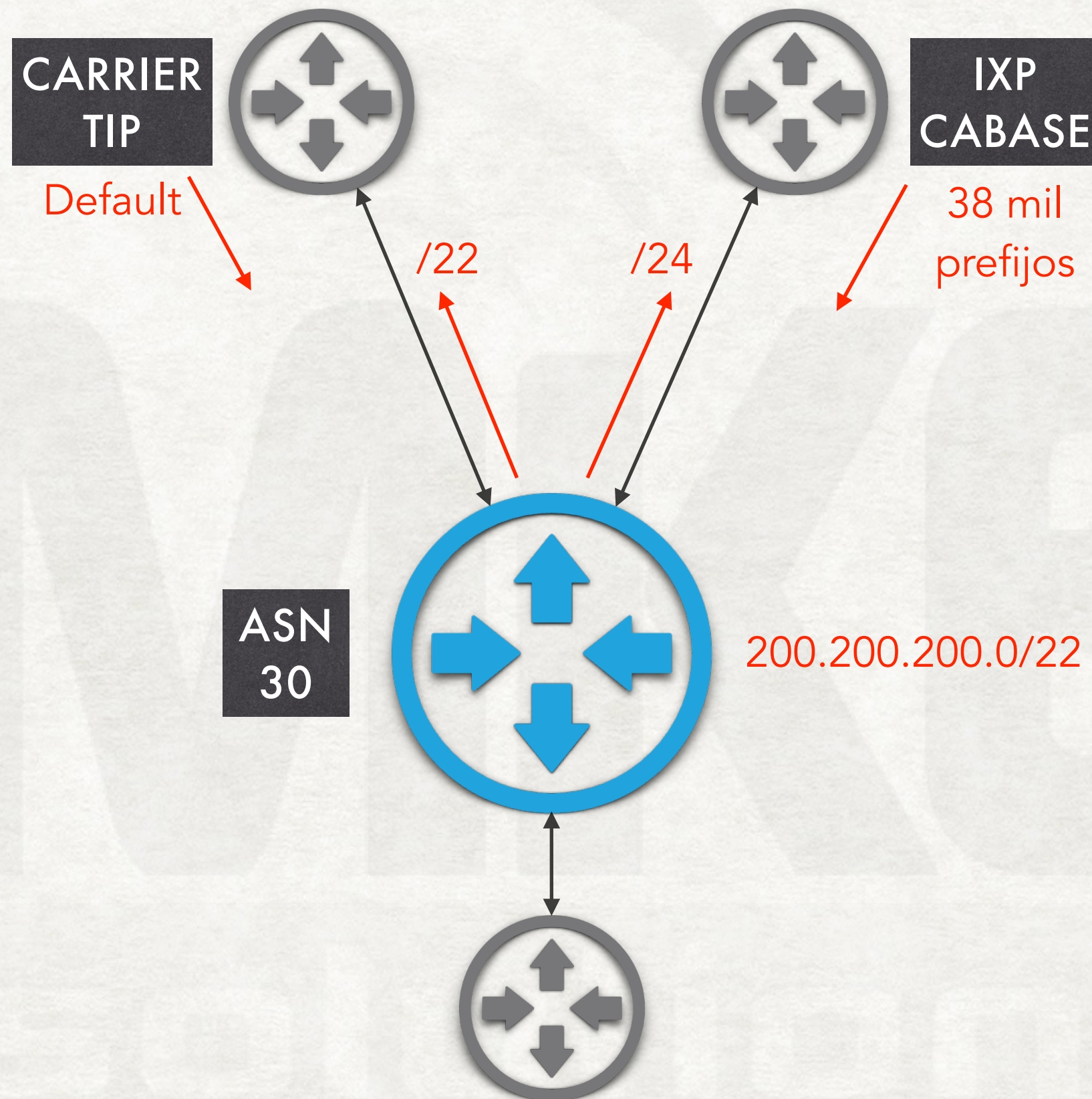
## Routing Filter Rule

Chain:

Rule:

```
reject;
```

# LAB!!!



# Ayuda Memoria en Filtros

---

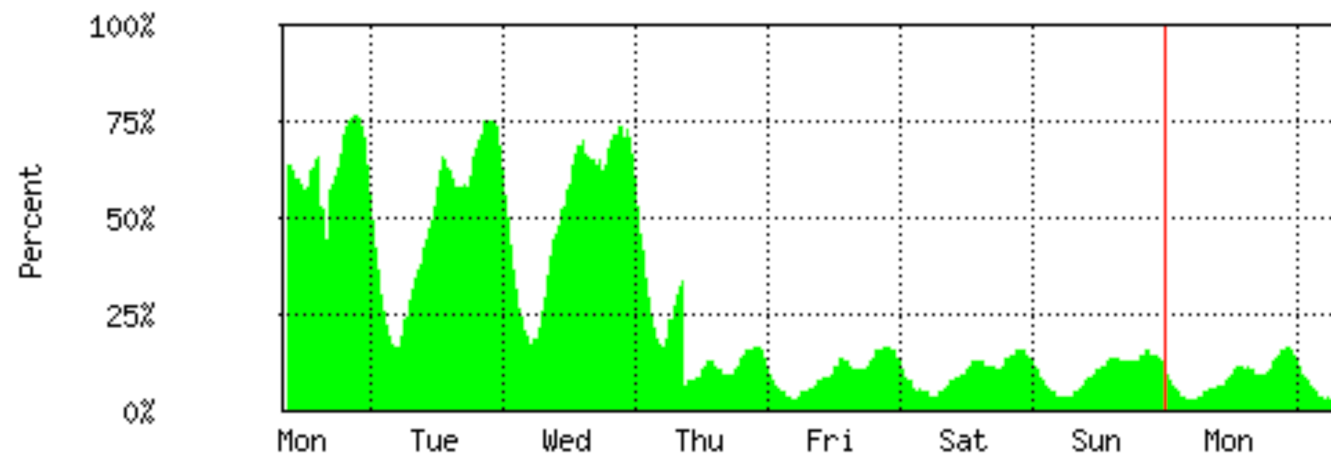
```
if (dst == 0.0.0.0/0) {  
  if (dst-len in 25-32) {  
    if (dst in 200.200.200.0/22 && dst-len == 24) {  
      if (dst in 200.200.200.0/22 && dst-len in 22-24) {  
        if (dst-len == 32 && bgp-communities includes 65000:666 ) {  
          if (bgp-as-path 15169$) {  
            if (bgp-path-len >= 100) {  
              if (dst in 2803:13e0::/32 && dst-len in 32-48) {
```

```
set comment "Comentario FILTRO BGP";  
set pref-src 100.100.100.1;  
set bgp-weight 200;  
set bgp-local-pref 200;  
set bgp-path-prepend 3;  
set bgp-communities 7049:666; / append bgp-communities 7049:666;  
set bgp-ext-communities rt:52376:6939; / append bgp-ext-communities rt:52376:666;  
set blackhole yes;  
accept; / reject;
```

# Optimización

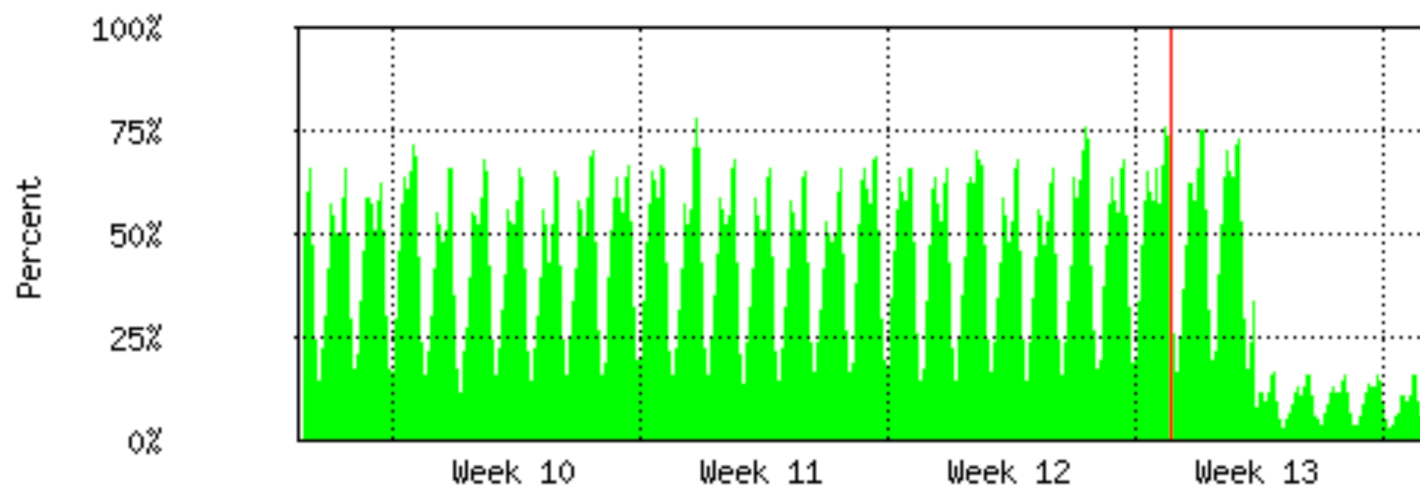
## ✓ Fastpath / Fasttrack

"Weekly" Graph (30 Minute Average)



Max: 77%; Average: 25%; Current: 4%;

"Monthly" Graph (2 Hour Average)



Max: 78%; Average: 40%; Current: 2%;

| IP Settings                         |                                           |
|-------------------------------------|-------------------------------------------|
| <input checked="" type="checkbox"/> | IP Forward                                |
| <input checked="" type="checkbox"/> | Send Redirects                            |
| <input type="checkbox"/>            | Accept Redirects                          |
| <input checked="" type="checkbox"/> | Secure Redirects                          |
| <input type="checkbox"/>            | Accept Source Route                       |
| <input checked="" type="checkbox"/> | Allow Fast Path                           |
| RP Filter:                          | no                                        |
| IPv4 Multipath Hash Policy:         | l3                                        |
| <input checked="" type="checkbox"/> | TCP SynCookies                            |
| TCP Timestamps:                     | random-offset                             |
| Max Neighbor Entries:               | 16384                                     |
| ARP Timeout:                        | 00:00:30                                  |
| ICMP Rate Limit:                    | 10                                        |
| <input type="checkbox"/>            | ICMP Errors Use Inbound Interface Address |
| <input checked="" type="checkbox"/> | IPv4 Fast Path Active                     |
| IPv4 Fast Path Packets:             | 6355734 323 382                           |
| IPv4 Fast Path Bytes:               | 1820113.1 GiB                             |
| <input type="checkbox"/>            | IPv4 Fasttrack Active                     |
| IPv4 Fasttrack Packets:             | 0                                         |
| IPv4 Fasttrack Bytes:               | 0 B                                       |

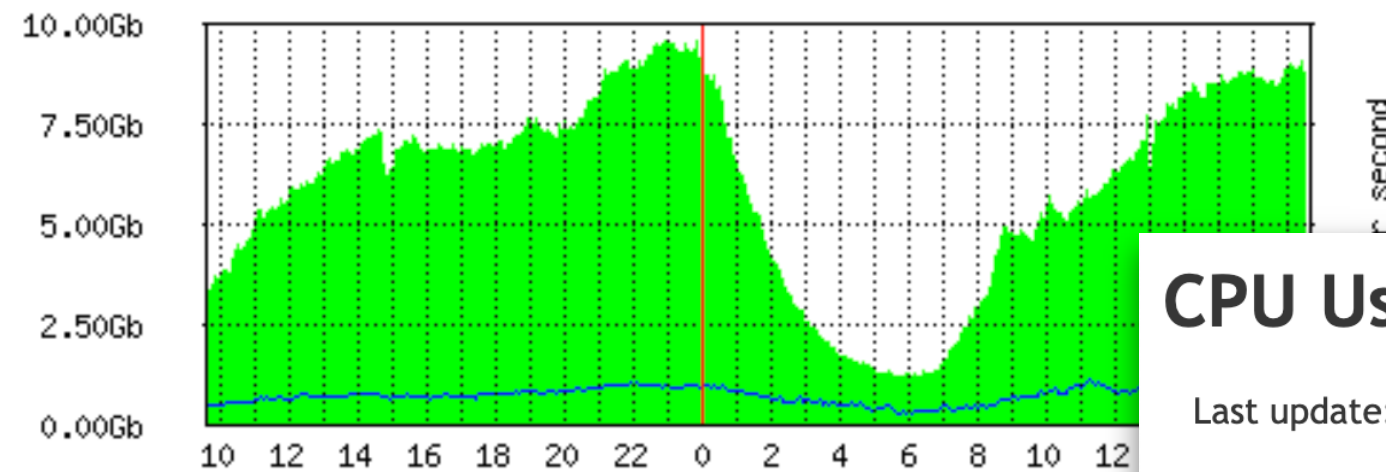
# Optimización

## ✓ L3HW - Layer 3 Hardware Offload

### Interface <bonding-WAN> Statistics

Last update: Sun Oct 26 17:36:50 2025

#### "Daily" Graph (5 Minute Average)



| L3 Hw Settings     |          |
|--------------------|----------|
| General            | Advanced |
| Monitor            |          |
| Error Code:        | 0        |
| State:             | OK       |
| IPv4 Routes Total: | 29       |
| IPv4 Routes HW:    | 18       |
| IPv4 Routes CPU:   | 10       |

☐ Switch All Ports

Cpu Flow Control:

☒ L3 Hw Offloading

☐ QoS Hw Offloading

### CPU Usage

Last update: Sun Oct 26 17:51:50 2025

#### "Daily" Graph (5 Minute Average)



# Comparación de CPU

## L3HW

## Fastpath

## Fasttrack

| Resources                   |                     |
|-----------------------------|---------------------|
| Uptime:                     | 160d 08:56:28       |
| Free Memory:                | 14.7 GiB            |
| Total Memory:               | 16.0 GiB            |
| CPU:                        | ARM64               |
| CPU Count:                  | 16                  |
| CPU Frequency:              | 2000 MHz            |
| CPU Load:                   | 1 %                 |
| Free HDD Space:             | 101.9 MiB           |
| Total HDD Size:             | 128.0 MiB           |
| Sector Writes Since Reboot: | 37 808 786          |
| Total Sector Writes:        | 95 419 667          |
| Bad Blocks:                 | 0.1 %               |
| Architecture Name:          | arm64               |
| Board Name:                 | CCR2216-1G-12XS-2XQ |
| Version:                    | 7.18.2 (stable)     |
| Build Time:                 | 2025-03-11 11:59:04 |
| Factory Software:           | 7.11.2              |

| Resources                   |                     |
|-----------------------------|---------------------|
| Uptime:                     | 160d 08:57:35       |
| Free Memory:                | 14.7 GiB            |
| Total Memory:               | 16.0 GiB            |
| CPU:                        | ARM64               |
| CPU Count:                  | 16                  |
| CPU Frequency:              | 2000 MHz            |
| CPU Load:                   | 45 %                |
| Free HDD Space:             | 101.9 MiB           |
| Total HDD Size:             | 128.0 MiB           |
| Sector Writes Since Reboot: | 37 808 797          |
| Total Sector Writes:        | 95 419 678          |
| Bad Blocks:                 | 0.1 %               |
| Architecture Name:          | arm64               |
| Board Name:                 | CCR2216-1G-12XS-2XQ |
| Version:                    | 7.18.2 (stable)     |
| Build Time:                 | 2025-03-11 11:59:04 |
| Factory Software:           | 7.11.2              |

| Resources                   |                     |
|-----------------------------|---------------------|
| Uptime:                     | 160d 08:58:42       |
| Free Memory:                | 14.6 GiB            |
| Total Memory:               | 16.0 GiB            |
| CPU:                        | ARM64               |
| CPU Count:                  | 16                  |
| CPU Frequency:              | 2000 MHz            |
| CPU Load:                   | 58 %                |
| Free HDD Space:             | 101.9 MiB           |
| Total HDD Size:             | 128.0 MiB           |
| Sector Writes Since Reboot: | 37 808 817          |
| Total Sector Writes:        | 95 419 698          |
| Bad Blocks:                 | 0.1 %               |
| Architecture Name:          | arm64               |
| Board Name:                 | CCR2216-1G-12XS-2XQ |
| Version:                    | 7.18.2 (stable)     |
| Build Time:                 | 2025-03-11 11:59:04 |
| Factory Software:           | 7.11.2              |

```
[mke@Borde BGP] > interface/monitor-traffic aggregate
rx-packets-per-second: 2 547 325
rx-bits-per-second: 19.5Gbps
fp-rx-packets-per-second: 128
fp-rx-bits-per-second: 107.2kbps
rx-drops-per-second: 0
```

# Conclusiones

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- ✓ No hay que tenerle miedo a v7, pero el proceso de actualización de v6 a v7 no es del todo automático.

¿Porqué migrar BGP a v7?

- ✓ Mejoras en el tiempo de aprendizaje de las rutas y en la carga de CPU.
- ✓ Corrección de vulnerabilidades y bugs.
- ✓ Soporte para nuevas funcionalidades (VXLAN, IS-IS, RPKI, eVPN, etc).
- ✓ El software está más preparado para routing.
- ✓ Nuevos hardware (v7 only) con chipset especiales para enrutamiento por hard.

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# ¿PREGUNTAS?

# ¡MUCHAS GRACIAS!

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