VoIP en la PYME

MUM SPAIN 2016

Madrid, España, Europa

Septiembre 2016

Jorge Montero

Systems Architect | Alhambra-Eidos

¿QUÉ VAMOS A VER HOY?

INTRODUCCIÓN

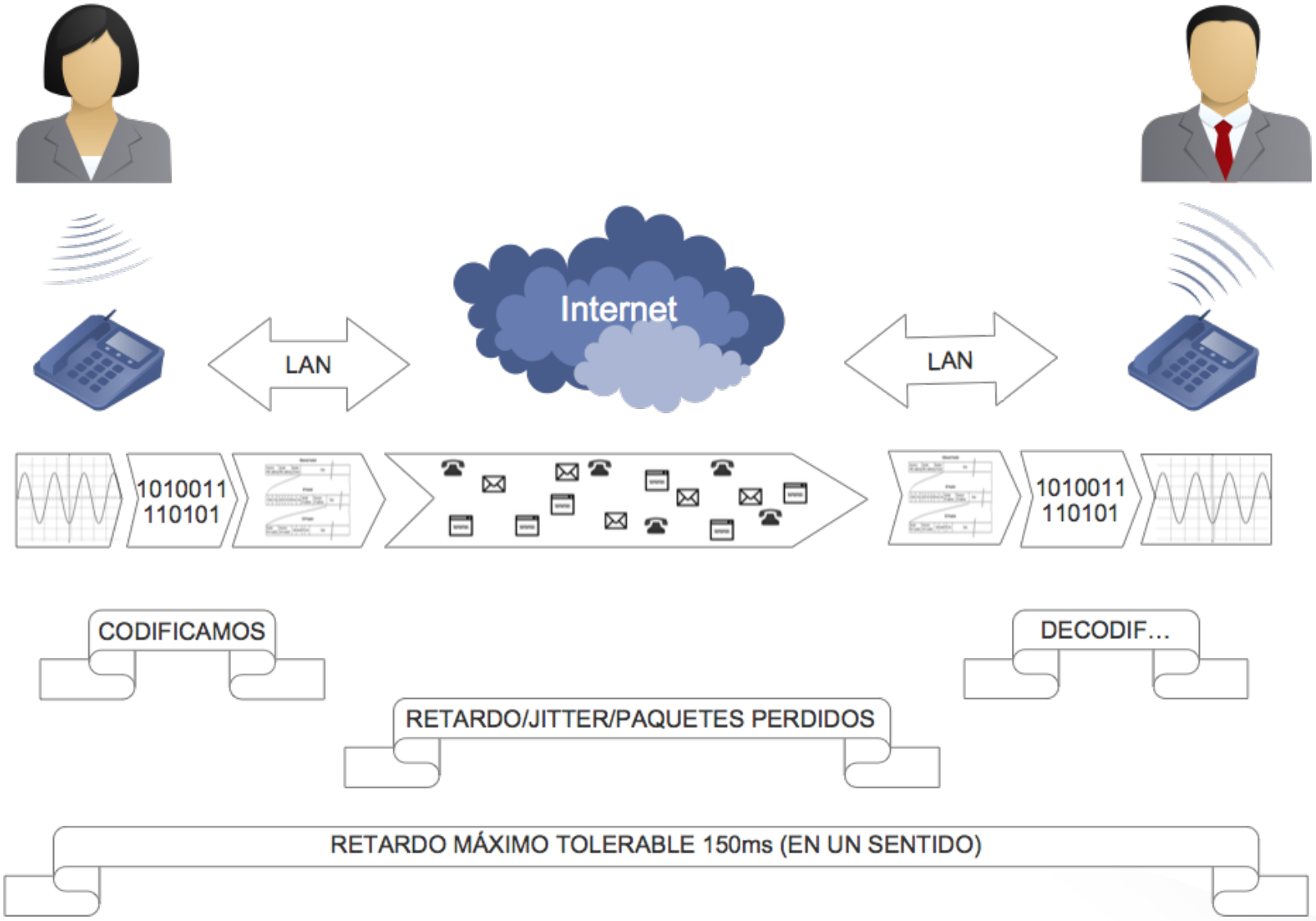
> VoIP: Es un tráfico sensible

> RouterOS tiene las herramientas

> Lecciones aprendidas

> El escenario más común

CÓMO SE TRANSMITE LA VOZ



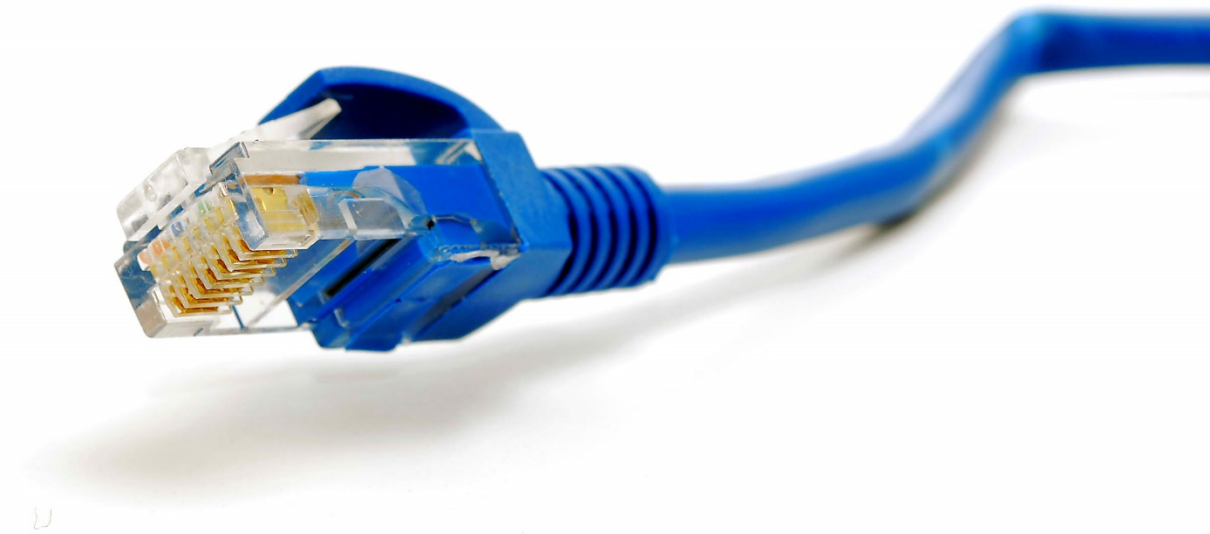
VoIP, ES UN TRÁFICO SENSIBLE

> No tolera retardos

> No admite perdida de paquetes

> No jitter

> No NAT



RouterOS

TIENE LAS HERRAMIENTAS

MUM
MikroTik User Meeting

> Filter rules

> Mangle

> Queues

> Torch

> Log

alhambra eidos

25 years

LECCIONES APRENDIDAS

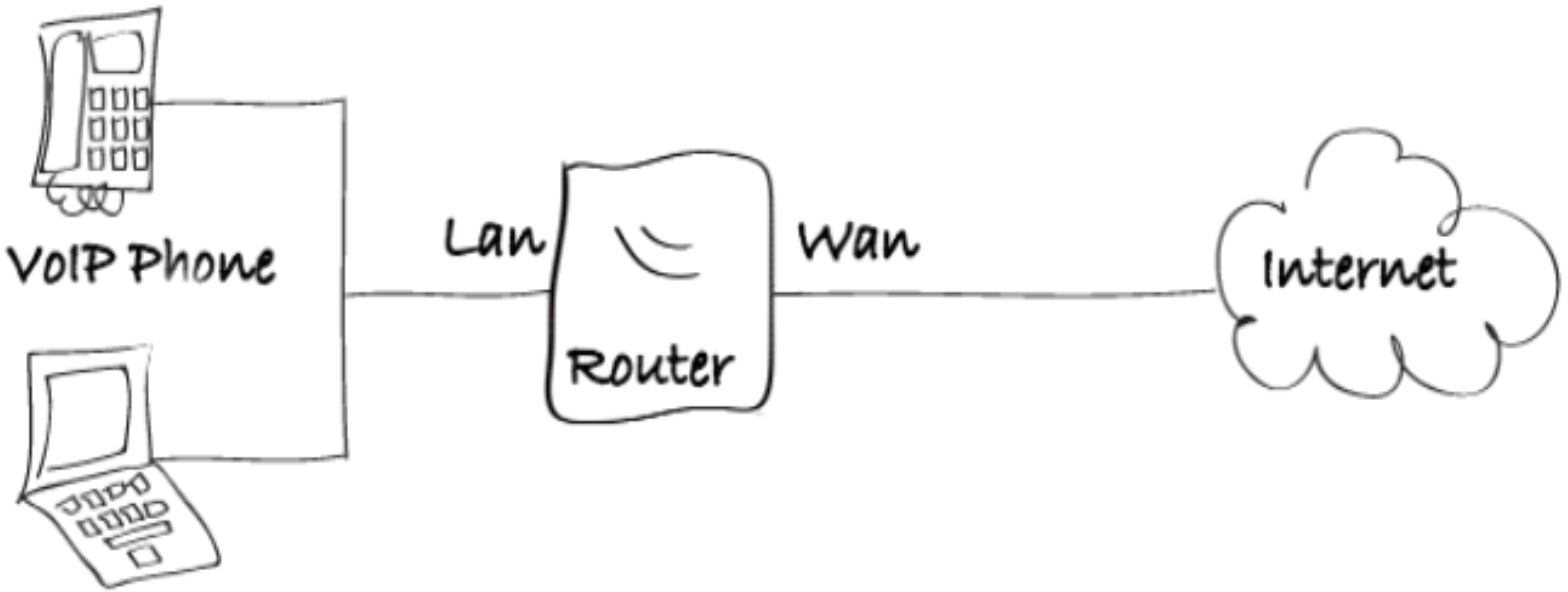
> No es cosa de dos

> Queremos que sea fácil

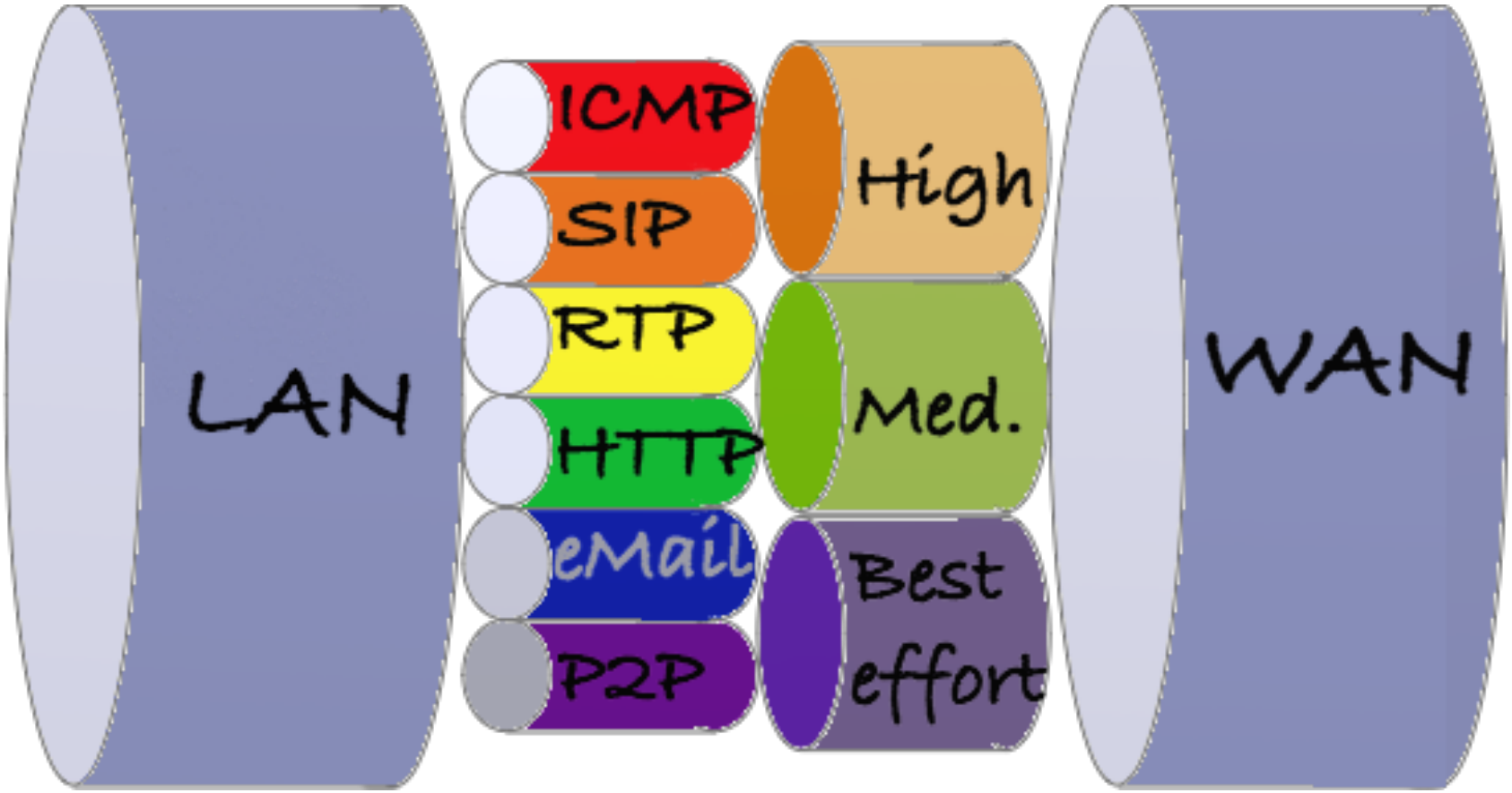
> La base es IP

> SIP Helpers

ESCENARIO MÁS COMÚN



OBJETIVO



Desde parte LAN*
*sucio y sin orden

Filtrado
-Firewall-

Clasificado
-Mangle/Queues-

Hacia el exterior*
*limpio y clasificado

¿CÓMO SE HACE?

Clasificando:

> El tráfico conocido

> Listando el tráfico desconocido

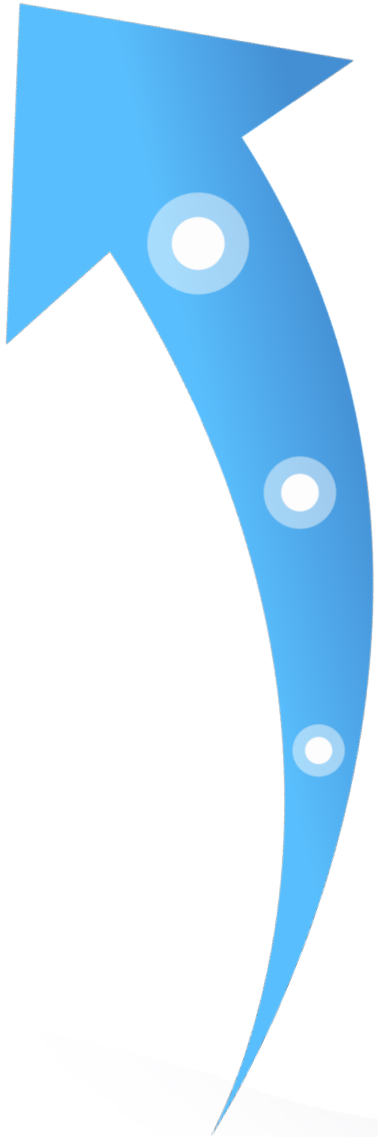
Marcando:

> Usa las funciones de RouterOS

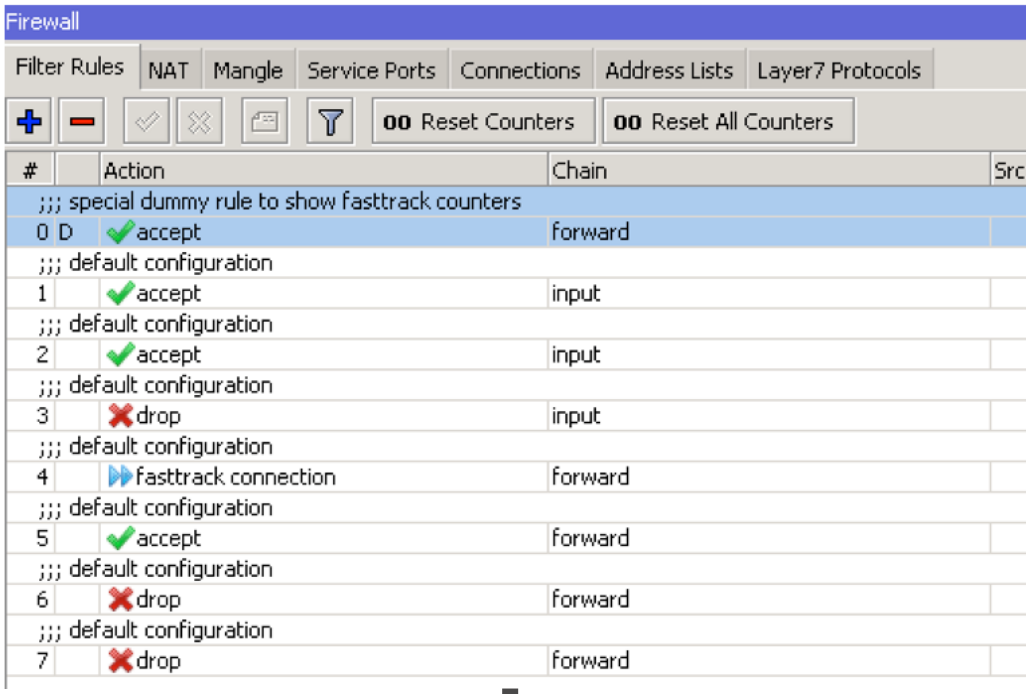
> Monitoriza el consumo

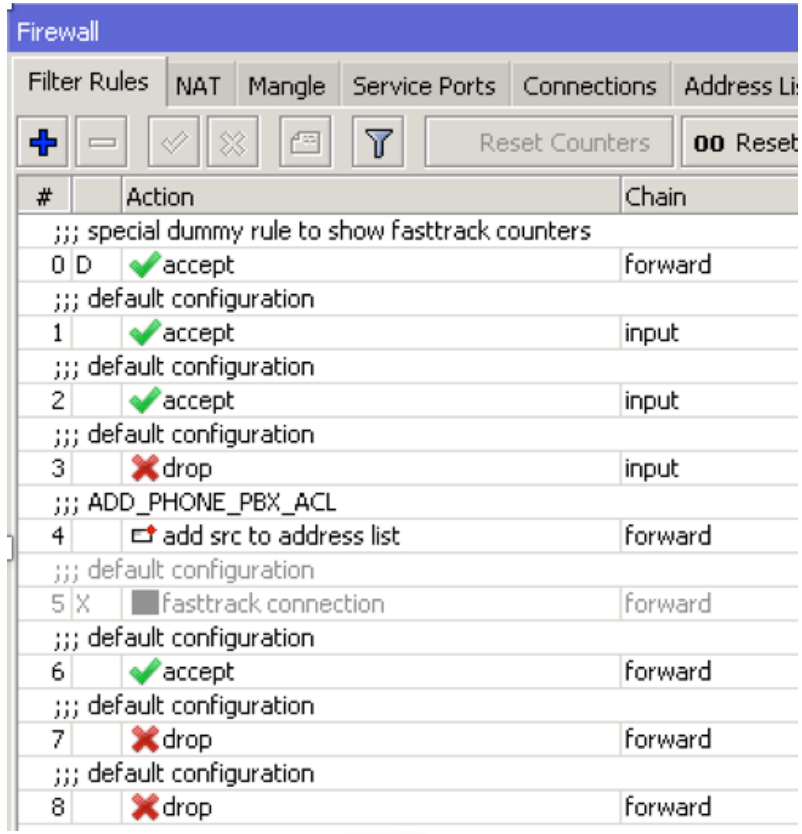
Repartiendo:

> VoIP es nuestro objetivo, cuida el resto



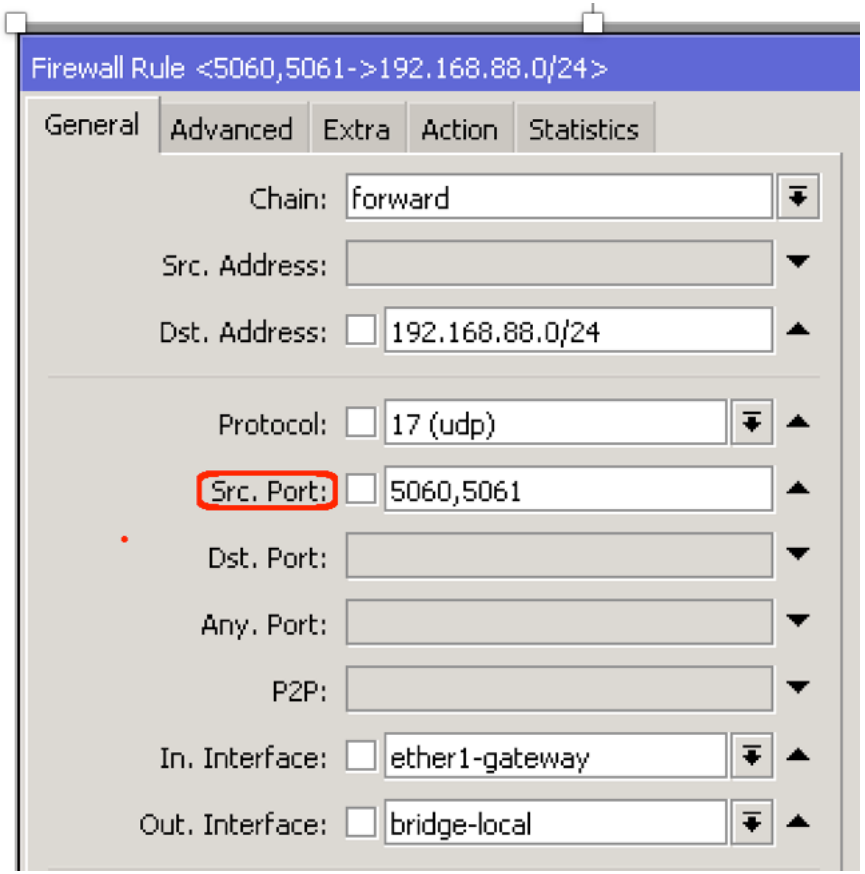
FILTER RULES

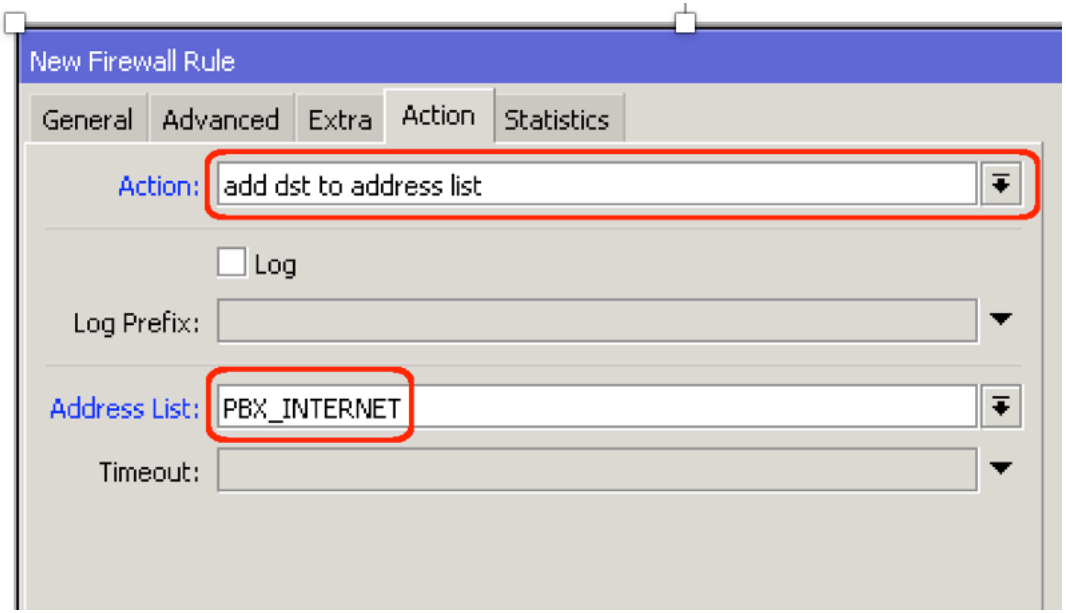




FILTRADO DINÁMICO

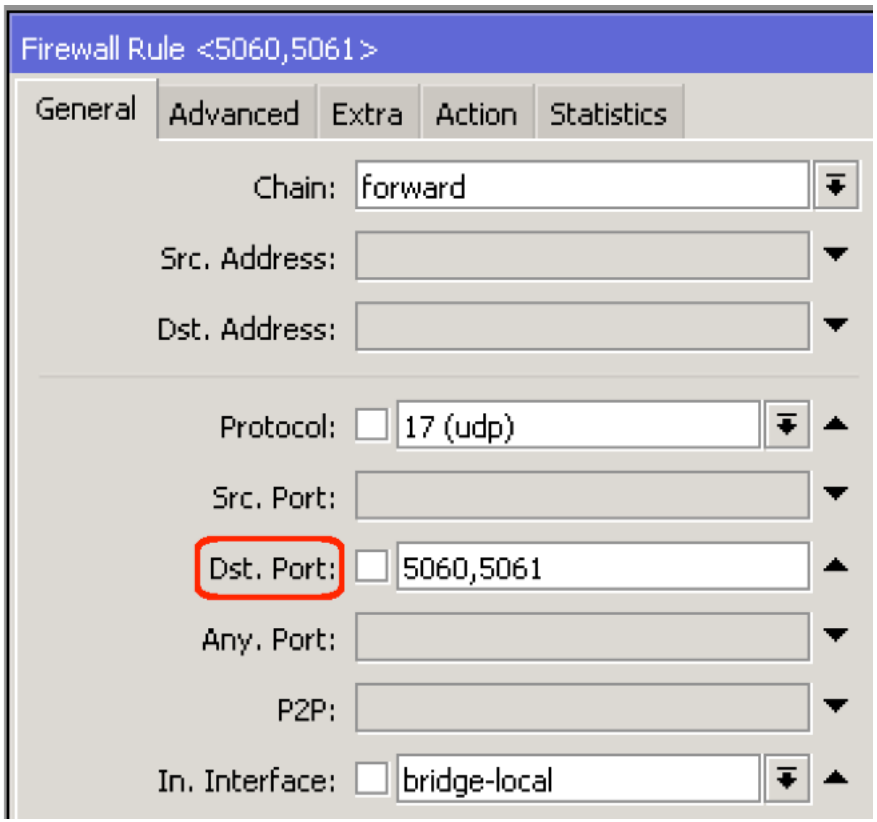
¿Cuál es la IP de la PBX?

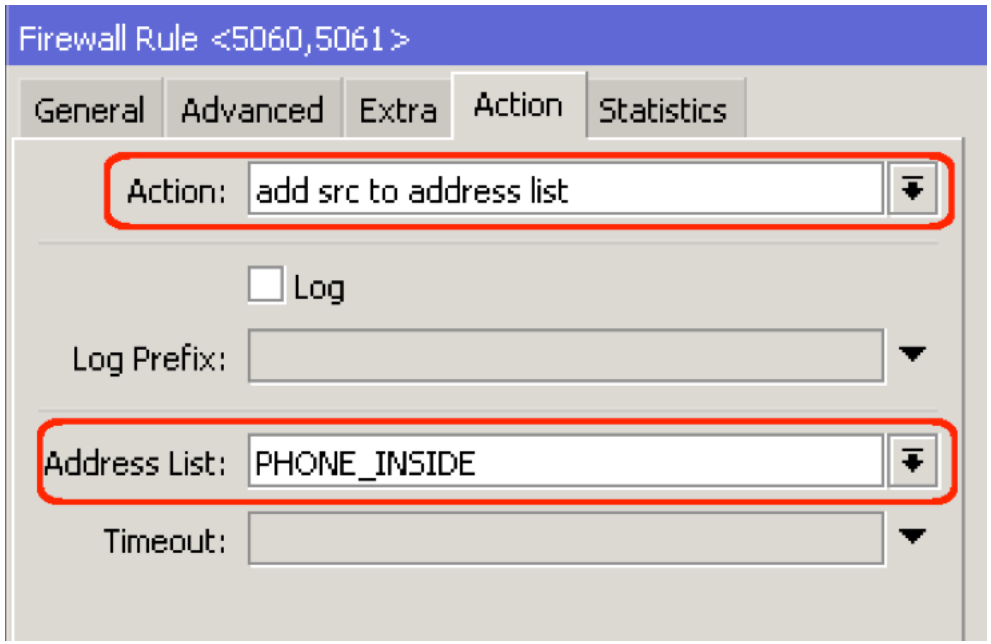




FILTRADO DINÁMICO

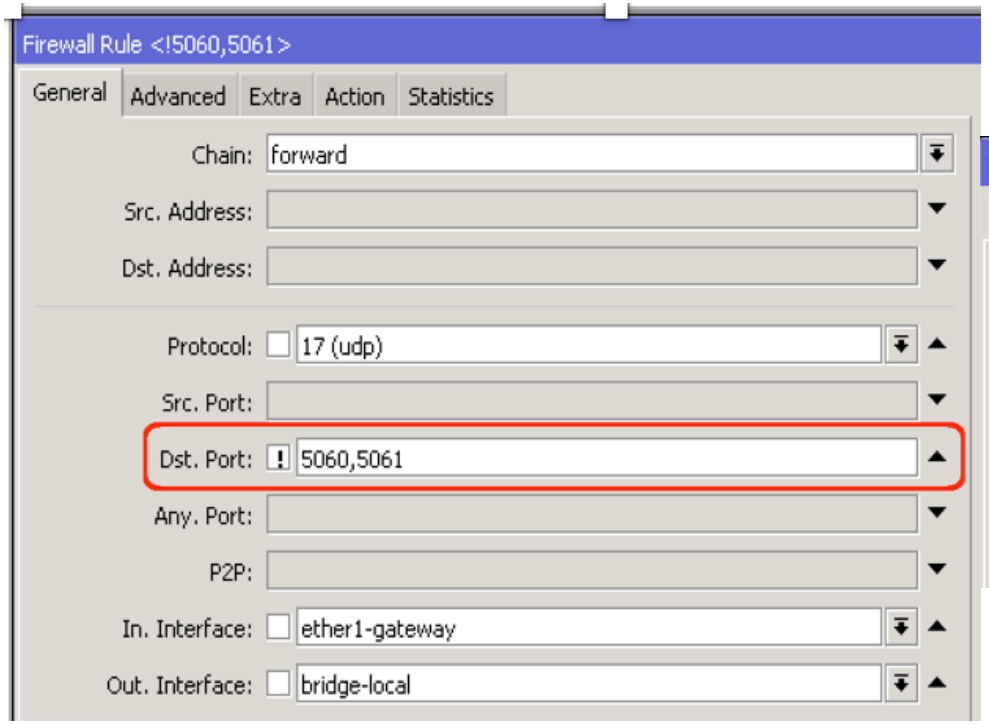
¿IP del teléfono?

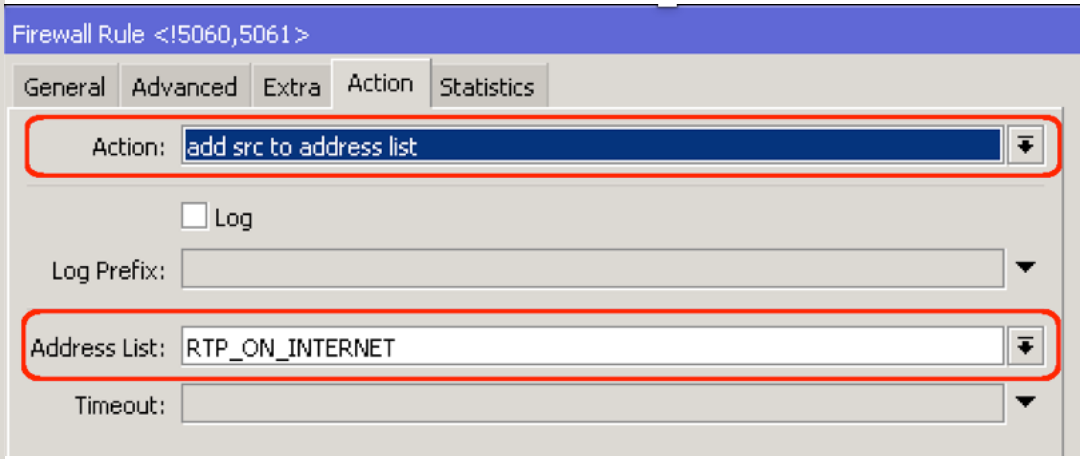


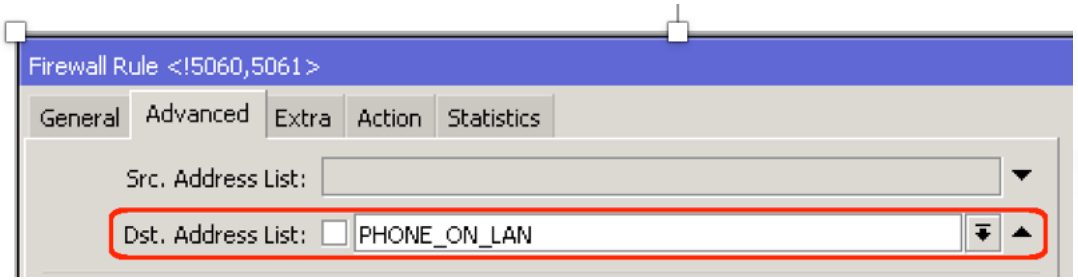


¿VIENE LA VOZ DESDE LA PBX?

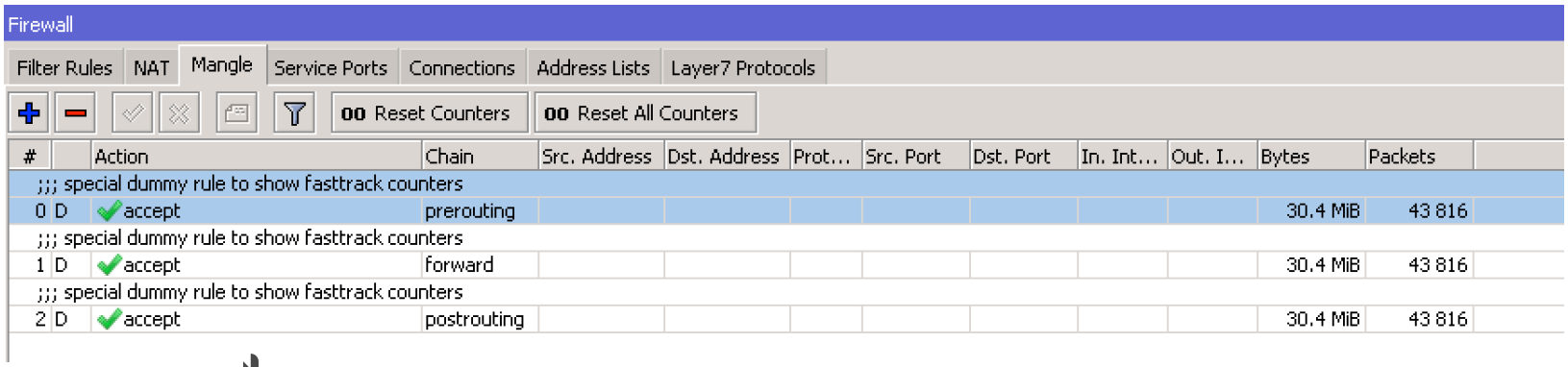
¡Señalización y audio no es lo mismo!

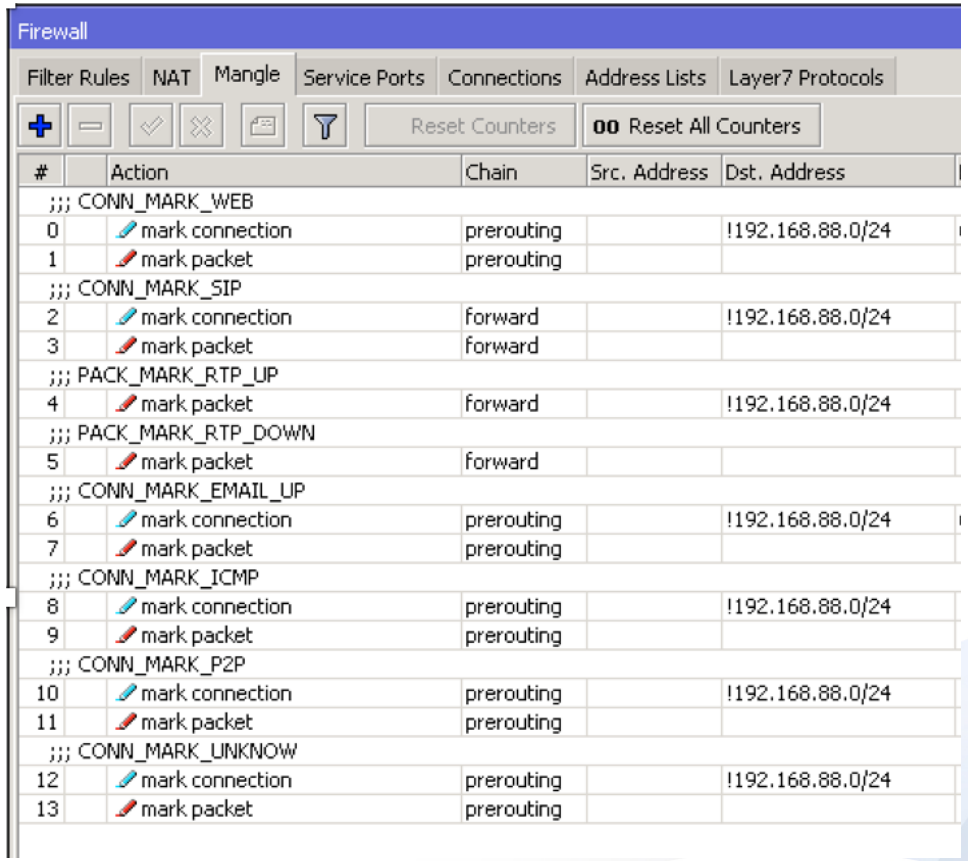






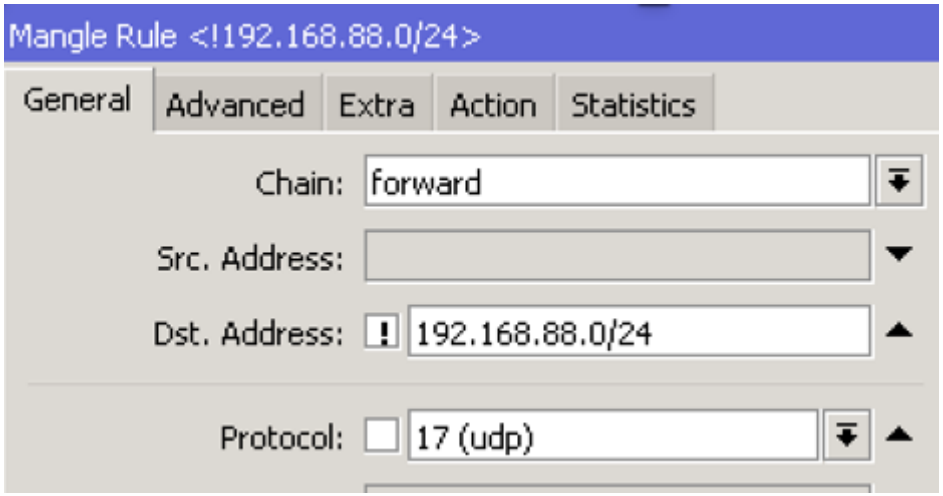
MANGLE

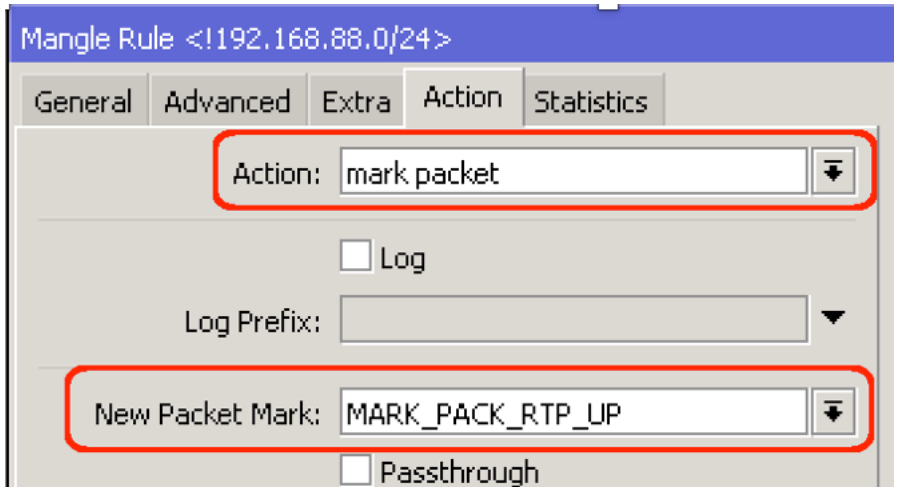

Firewall
Filter Rules
NAT
Mangle
Service Ports
Connections
Address Lists
Layer7 Protocols
Reset Counters
Reset All Counters
Action Chain Src. Address Dst. Address Prot... Src. Port Dst. Port In. Int... Out. I... Bytes Packets
;;; special dummy rule to show fasttrack counters
0 D accept prerouting 30.4 MiB 43 816
;;; special dummy rule to show fasttrack counters
1 D accept forward 30.4 MiB 43 816
;;; special dummy rule to show fasttrack counters
2 D accept postrouting 30.4 MiB 43 816

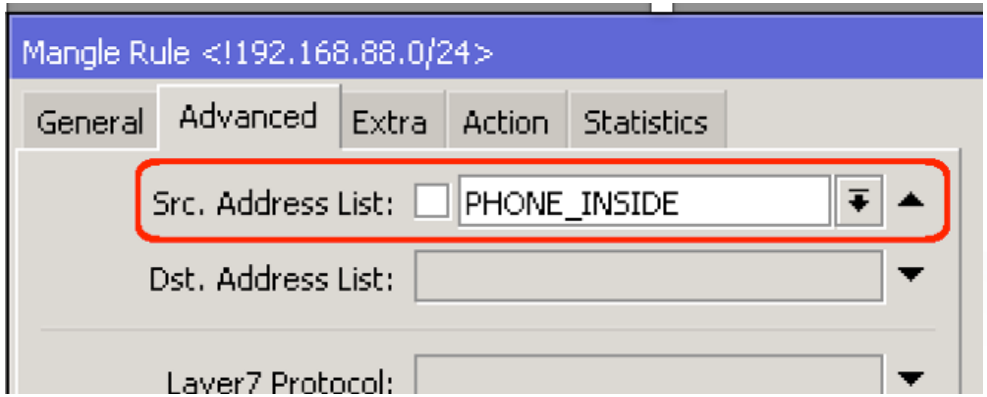

Firewall
Filter Rules
NAT
Mangle
Service Ports
Connections
Address Lists
Layer7 Protocols
Reset Counters
Reset All Counters
Action Chain Src. Address Dst. Address
;;; CONN_MARK_WEB
0 mark connection prerouting !192.168.88.0/24
1 mark packet prerouting
;;; CONN_MARK_SIP
2 mark connection forward !192.168.88.0/24
3 mark packet forward
;;; PACK_MARK_RTP_UP
4 mark packet forward !192.168.88.0/24
;;; PACK_MARK_RTP_DOWN
5 mark packet forward
;;; CONN_MARK_EMAIL_UP
6 mark connection prerouting !192.168.88.0/24
7 mark packet prerouting
;;; CONN_MARK_ICMP
8 mark connection prerouting !192.168.88.0/24
9 mark packet prerouting
;;; CONN_MARK_P2P
10 mark connection prerouting !192.168.88.0/24
11 mark packet prerouting
;;; CONN_MARK_UNKNOW
12 mark connection prerouting !192.168.88.0/24
13 mark packet prerouting

MARCANDO RTP CON MANGLE (SALIDA)

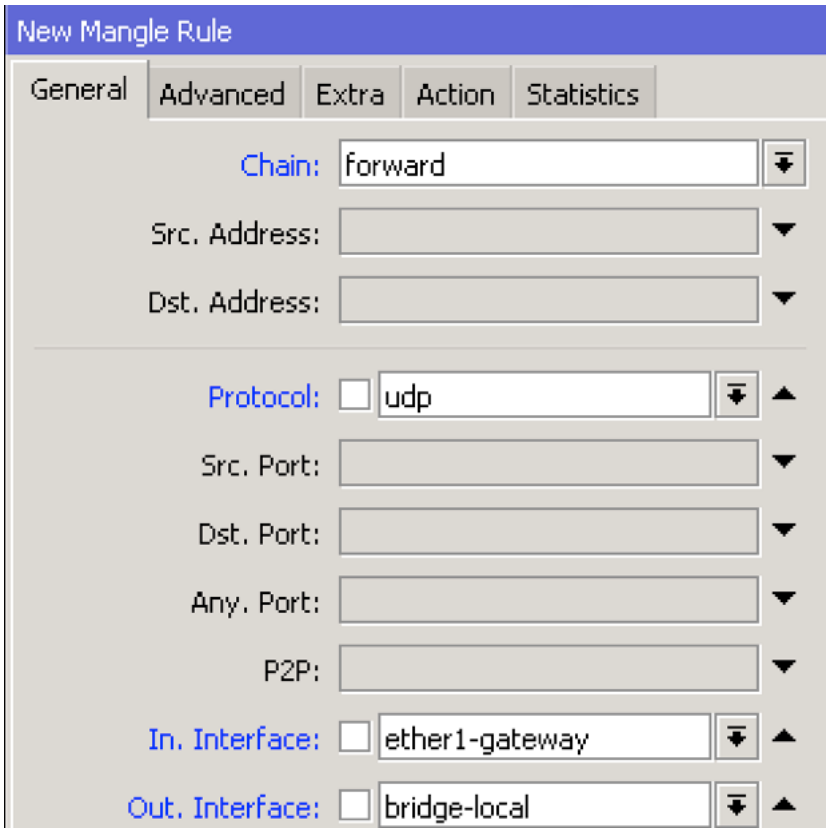
¡Ahora podemos poner todo en orden!

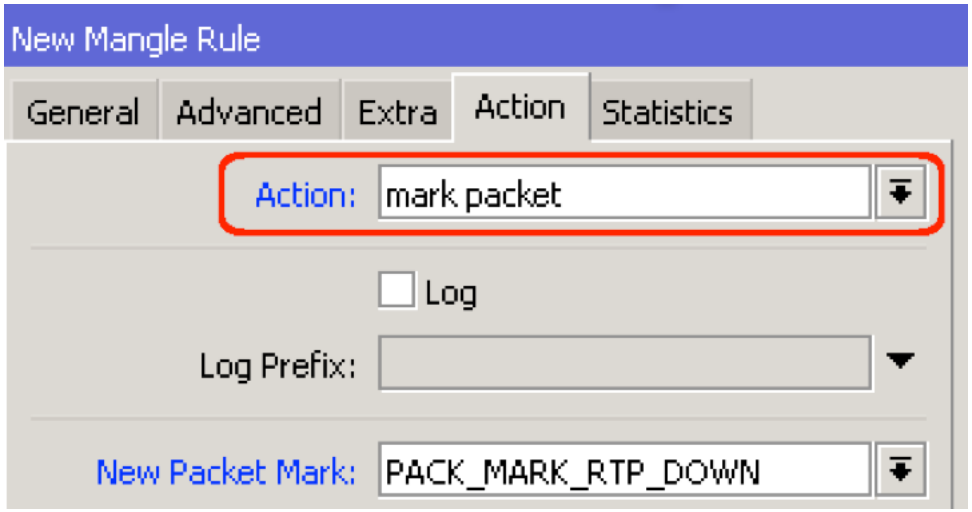


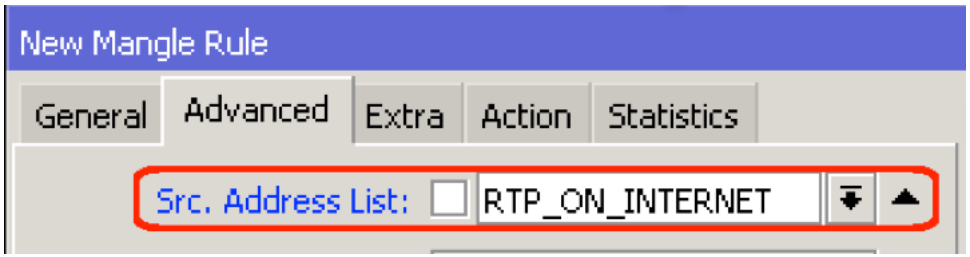




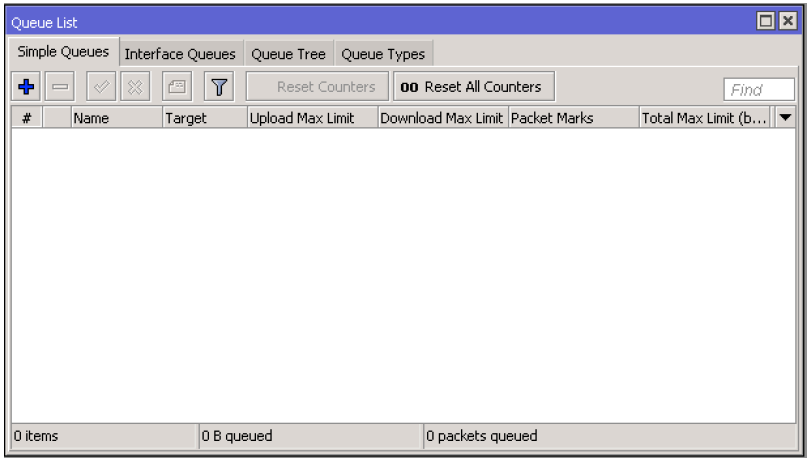
MARCANDO RTP CON MANGLE (ENTRADA)

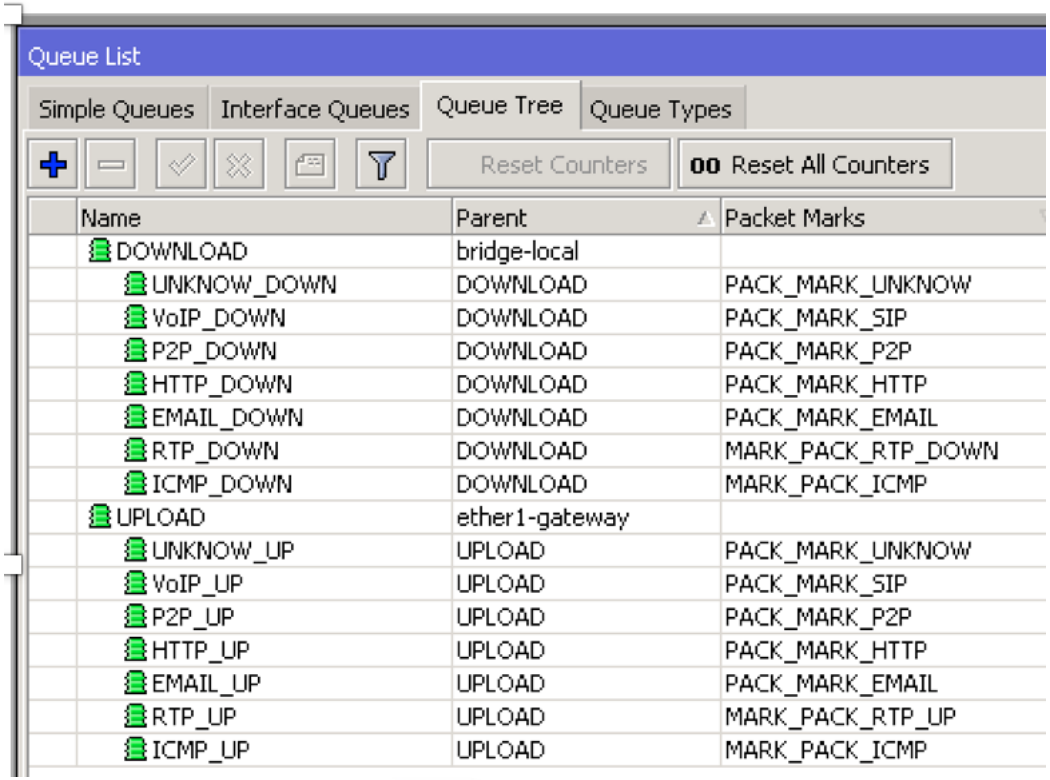






QUEUES


Queue List
Simple Queues
Interface Queues
Queue Tree
Queue Types
Reset Counters
00 Reset All Counters
Find
Name Target Upload Max Limit Download Max Limit Packet Marks Total Max Limit (b...
0 items
0 B queued
0 packets queued


Queue List
Simple Queues
Interface Queues
Queue Tree
Queue Types
Reset Counters
00 Reset All Counters
Name Parent Packet Marks
DOWNLOAD bridge-local
UNKNOW_DOWN DOWNLOAD PACK_MARK_UNKNOW
VoIP_DOWN DOWNLOAD PACK_MARK_SIP
P2P_DOWN DOWNLOAD PACK_MARK_P2P
HTTP_DOWN DOWNLOAD PACK_MARK_HTTP
EMAIL_DOWN DOWNLOAD PACK_MARK_EMAIL
RTP_DOWN DOWNLOAD MARK_PACK_RTP_DOWN
ICMP_DOWN DOWNLOAD MARK_PACK_ICMP
UPLOAD ether1-gateway
UNKNOW_UP UPLOAD PACK_MARK_UNKNOW
VoIP_UP UPLOAD PACK_MARK_SIP
P2P_UP UPLOAD PACK_MARK_P2P
HTTP_UP UPLOAD PACK_MARK_HTTP
EMAIL_UP UPLOAD PACK_MARK_EMAIL
RTP_UP UPLOAD MARK_PACK_RTP_UP
ICMP_UP UPLOAD MARK_PACK_ICMP

OBJETIVOS

Clasificando el tráfico:

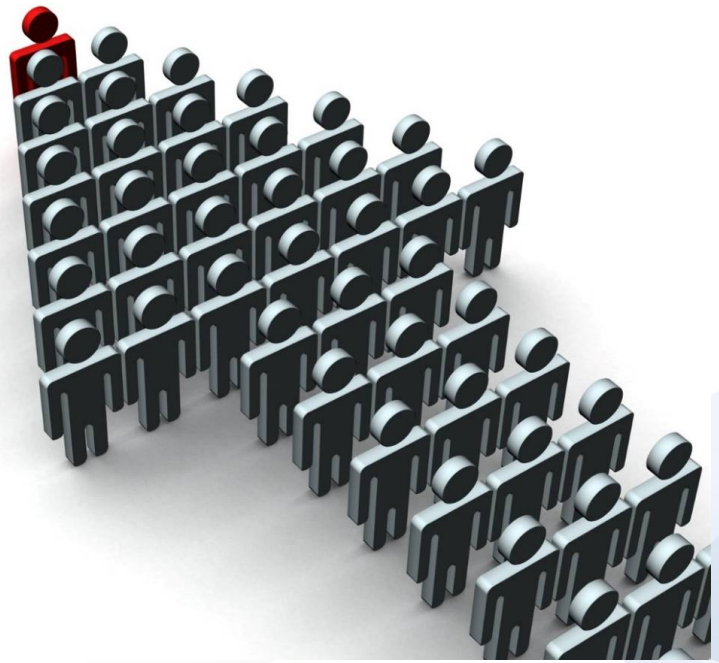
> Mangle es genial, y fácil de usar

> Organiza en capas

Marcando el tráfico:

> Verifica que las colas funcionan

> No solo tiene que parecer, debe ser



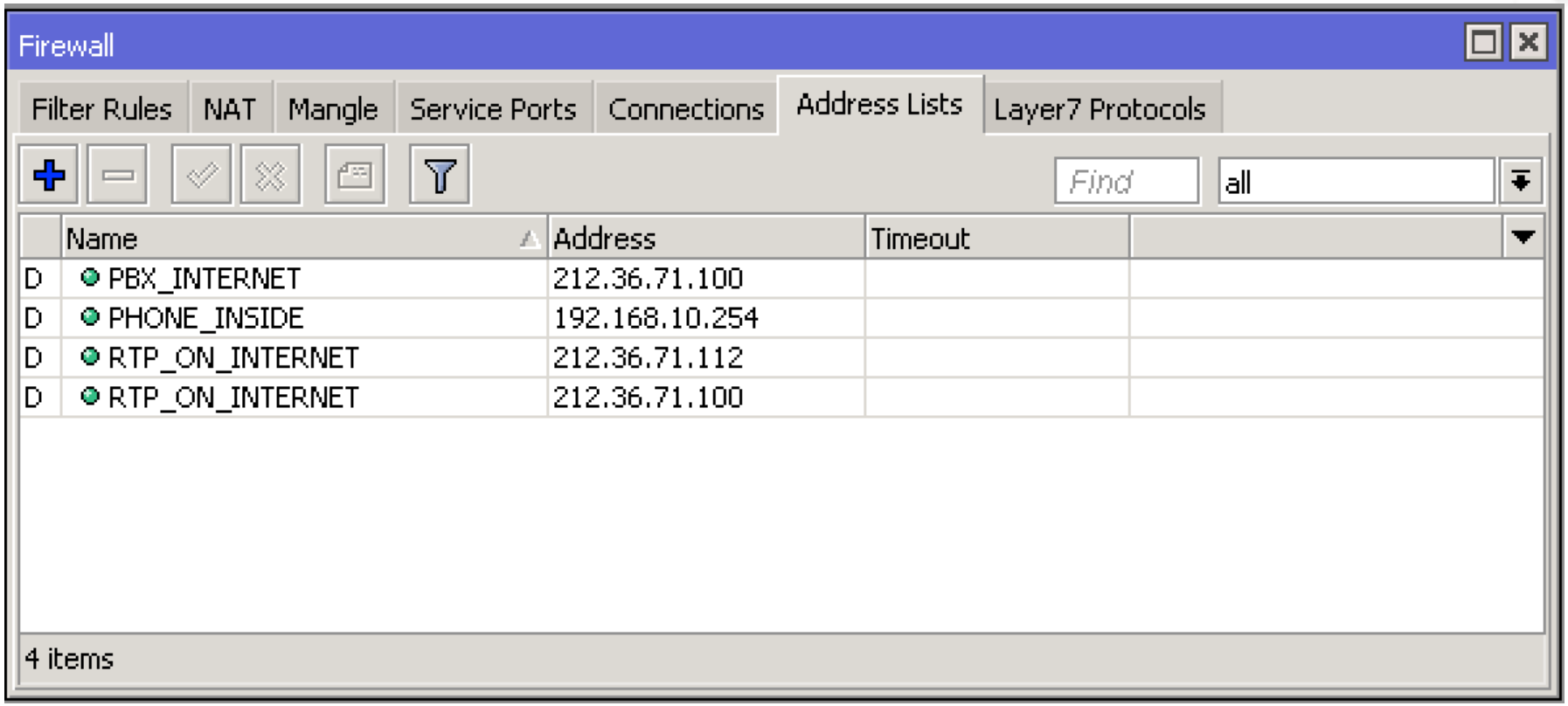
PRUEBA EN VIVO

> Accedemos al Router

> Registramos un softphone

> Hacemos una llamada*

¿FUNCIONA?



Tenemos las IPs que no conocíamos

PRUEBA EN VIVO

> Revisamos las listas

> Verificamos contadores y colas

*Es una empresa seria ;-)

RESUMEN

> Clasificar y marcar

> Puntos a vigilar: Jitter, packetloss, Queues

> RouterOS lo pone fácil

> QoS/Traffic nos da ventaja

> No pares de innovar, el negocio lo requiere

> Promueve la excelencia y… ¡diviértete!

¿Preguntas?

Gracias

@alhambraeidos
@monterolabs