MUM MikroTik User Meeting

Alta Disponibilidad con VRRP y Sincronización de configuración

Por: Maximiliano Dobladez
MKE Solutions

16 - 17 de Abril de 2018

Ciudad de México

MKE solutions

Presentación Personal

- Nombre: Maximiliano Dobladez
- ***CEO MKE Solutions***
- Consultor y Entrenador ***MikroTik RouterOS***
- Experiencia con *MikroTik RouterOS* desde 1999
- Entrenador desde 2006

- info@mkesolutions.net
- mdobladez
- @mdobladez

MUM

MKE Solutions

- Consultora en Telecomunicaciones
- Establecida en 2008
- Certificada en **ISO 9001:2015**
  - Soporte IT
  - Entrenamientos Oficiales

info@mkesolutions.net

@mkesolutions

/mkesolutions

/mkesolutions

www.MKESolutions.net

MikroTik

MKE solutions

MUM

Academia de Entrenamientos

MikroTik MTCNA

MikroTik MTCWE

MikroTik MTCTCE

MikroTik MTCUME

MikroTik MTCIPv6E

MikroTik MTCRE

MikroTik MTCINE

- Entrenamientos Públicos y Privados.
- ~300 alumnos por año, con un 75% de certificados.

Academia® DE ENTRENAMIENTOS

powered by MKE Solutions

MikroTik

MKE solutions

Soporte IT

- 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

MUM

Oráculo

oraculo monitoreo de redes

Status | Dashboard | Devices (226) | Maps | Syslog | Settings | Backups | Events (2) | ConfigHistory (1450) | Timeouts (4) | Account

NETWORK ONLINE 98.23% — Online 222 | Offline 4

TOTAL DEVICES 226 — Warning 3 | Timeout 4 | No Login 0

TOTAL PORTS & 76419 — Sensors 73147 | Ports 3230 | Add Options 42

EVENTS UNREAD 2 — With Warning Status 2

CONFIG HISTORY 1450 — Monitoring Devices 1

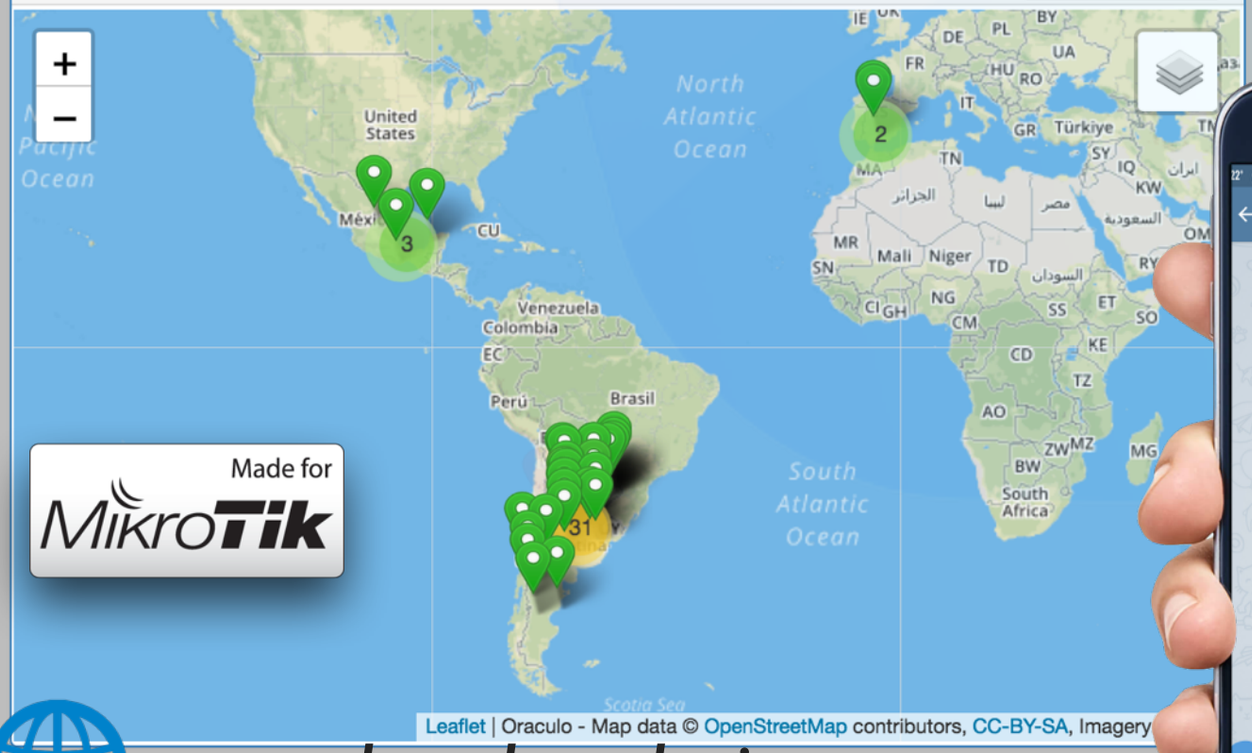
DISK USAGE 54% — Files Backups 21537 | Disk Backups 27G

Oraculo Server Status

Date	Uptime	License	Status	Bot Telegram	WebService
2018-04-11 14:30:28	14:30:28	OUTSOURCING	VALID_LICENSE	OK	OK
# CPU info	**CPU avr**	**Memory**	**Mem Used**	**Disk System**	**Disk Used**
3 Cores - Virtual a7769a6388d5	*2.61 1.92 1.91*	3.9 GiB	95%	59 GiB	56%

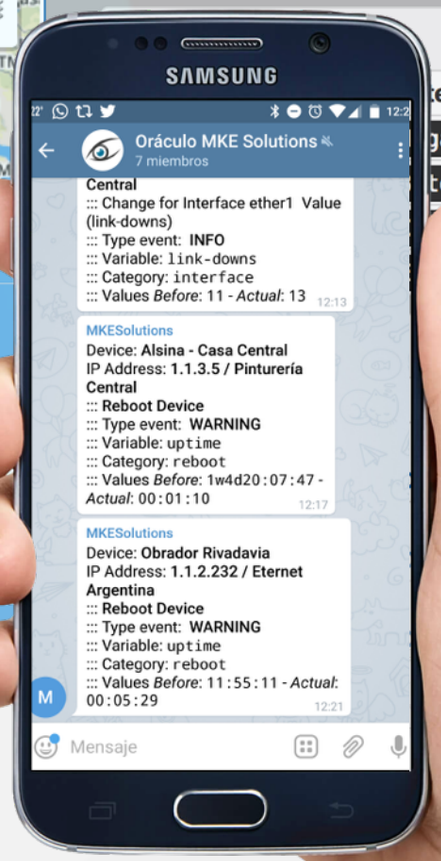
GeoMAPs Category

ZoomOut



Overview (1 Hour)

Device	AV 1h	RTT	PL	Downs	Alarms	Reboot	PF	Important
[redacted]	0%	0 ms	100%	0	0	0	0	4
[redacted]	0%	0 ms	99.97%	0	0	0	0	4
[redacted]	0%	0 ms	99.97%	0	0	0	0	4
[redacted]	0%	0 ms	98.21%	0	0	0	0	2
[redacted]	95.729%	331.52 ms	20.7%	15	0	0	0	2



Last Devices Timeout

Category	Last Seen	Last Probe	Status
gaImagen	40 minutes ago	44 minutes ago	Timeout
te Solution S.A.	20 hours ago	20 hours ago	Timeout
IP	March 28	March 28	Timeout
Argentina	March 27	March 27	Timeout

Last Events

	Event	Variable	Before	Actual
2.196 >	bgp	Change value for **peer** **Cache de Facebook BGP**	connect	active
96 >	bgp	Change value for **peer** **Cache de Facebook BGP**	active	connect
>	bgp	Change value for **peer** **Cache de Facebook BGP**	connect	active
	bgp	Change value for **peer**	active	connect

oraculo.mkesolutions.net

MikroTik

MKE solutions

Agenda

Desarrollo de la presentación:

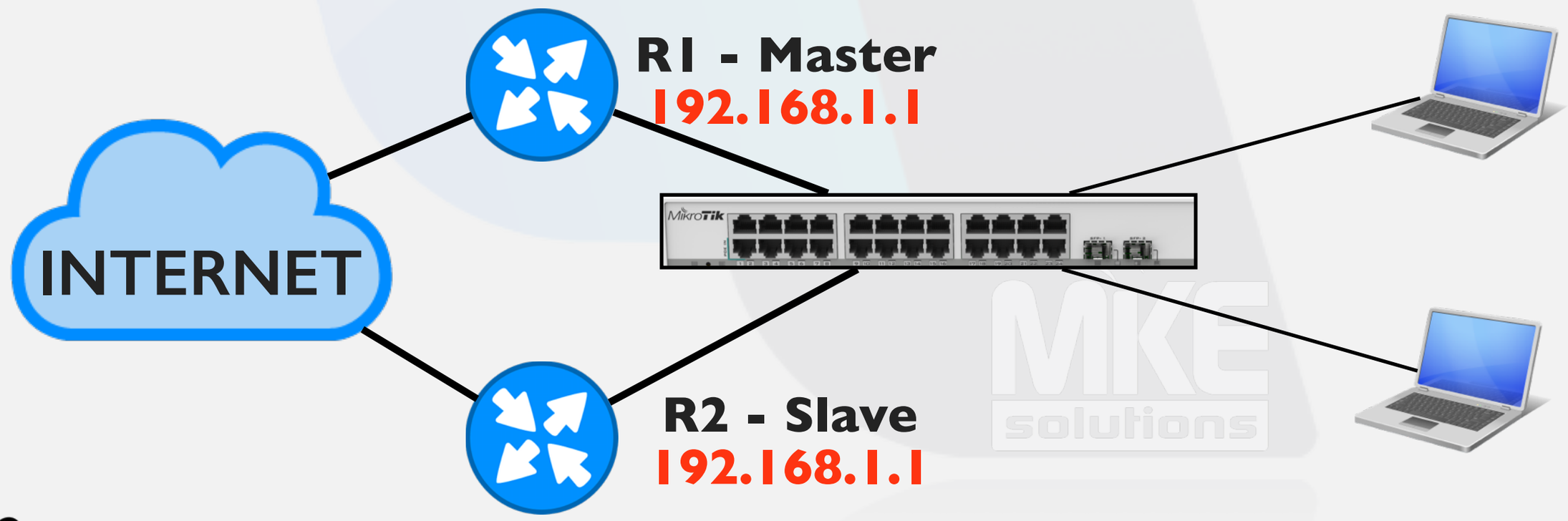
Conceptos Iniciales:

- **VRRP**: qué es?, cómo funciona? cómo se configura?
- **Sincronización**: como replicar la configuración del *Master* al *Backup*
- Recursos y bibliografía

VRRP

VRRP - Virtual Router Redundancy Protocol

- *VRRPv2:* RFC 3768 | *VRRPv3*: RFC 5798
- *ES* un protocolo de redundancia de routers.
- *NO ES* un protocolo de enrutamiento dinámico.
- *NO ES* un protocolo de balanceo de carga.

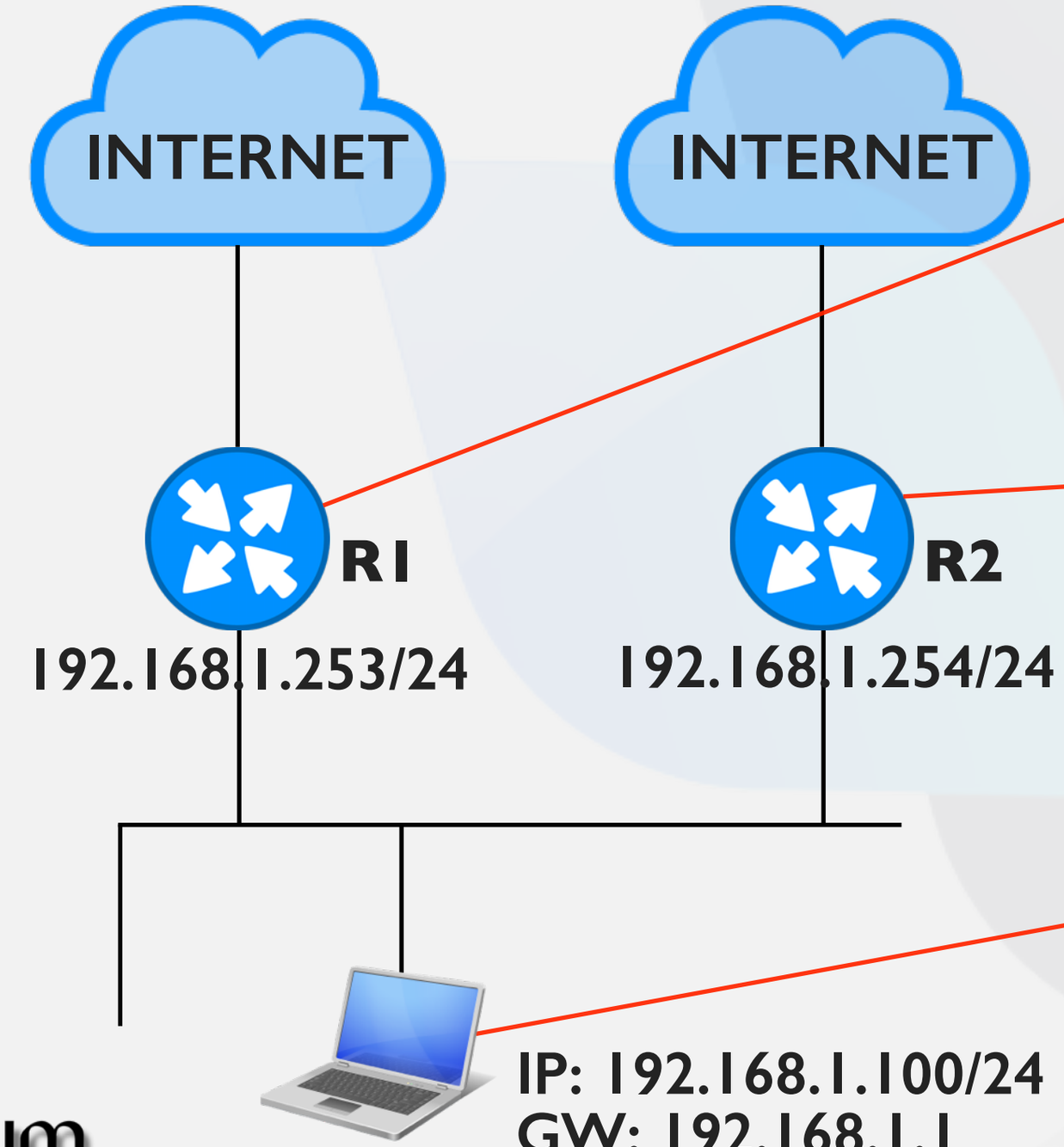


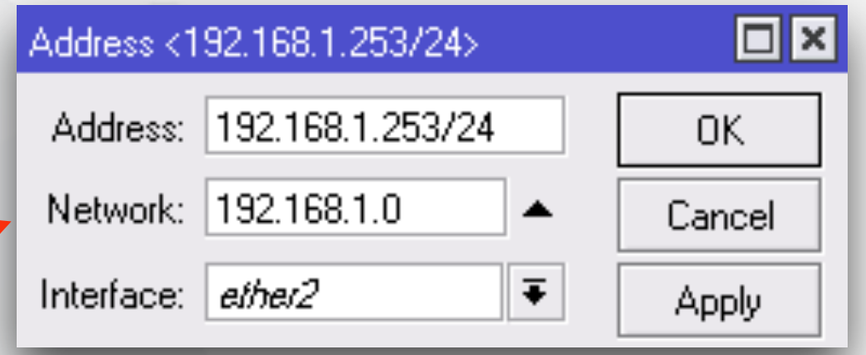
VRRP

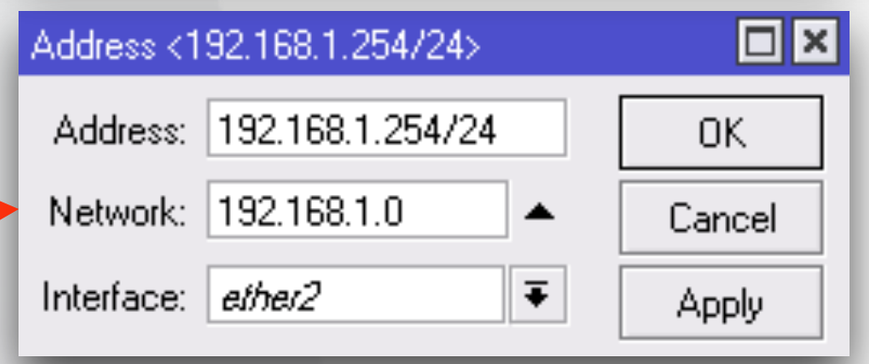
Cómo trabaja ?

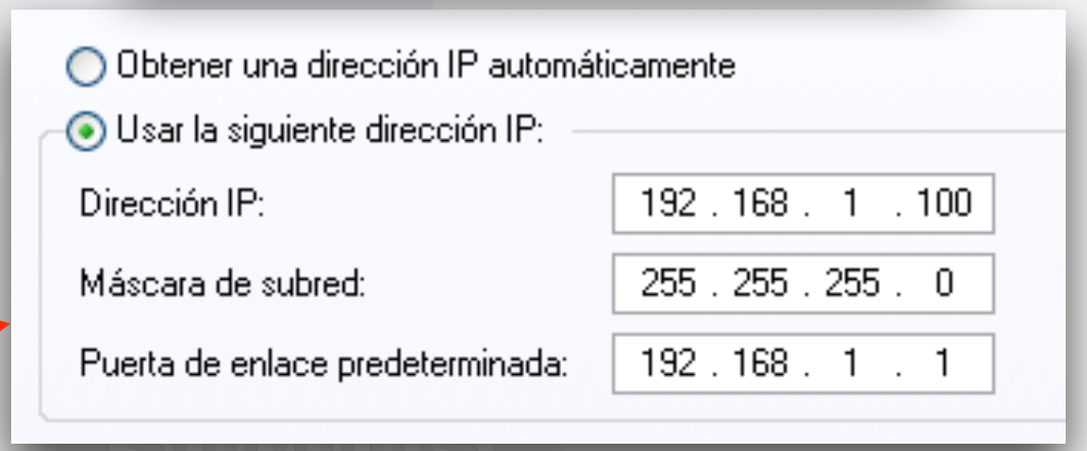
- ***Dos o más routers*** forman parte de un ***Cluster*** o ***Virtual Router*** (VR), compartiendo el mismo ***ID*** (***VRID***).
- En cada uno de ellos se levanta una ***interfaz virtual (vrrp) sobre la interfaz a redundar.***
- La ***prioridad asignada a la interfaz vrrp determinará el rol*** de cada router (master o backup).
- Todas las ***interfaces vrrp dentro del mismo VRID comparten la misma MAC-ADDRESS virtual.***
- Todos compartirán la misma dirección ***IP Virtual.***

Configuración básica - parte 1



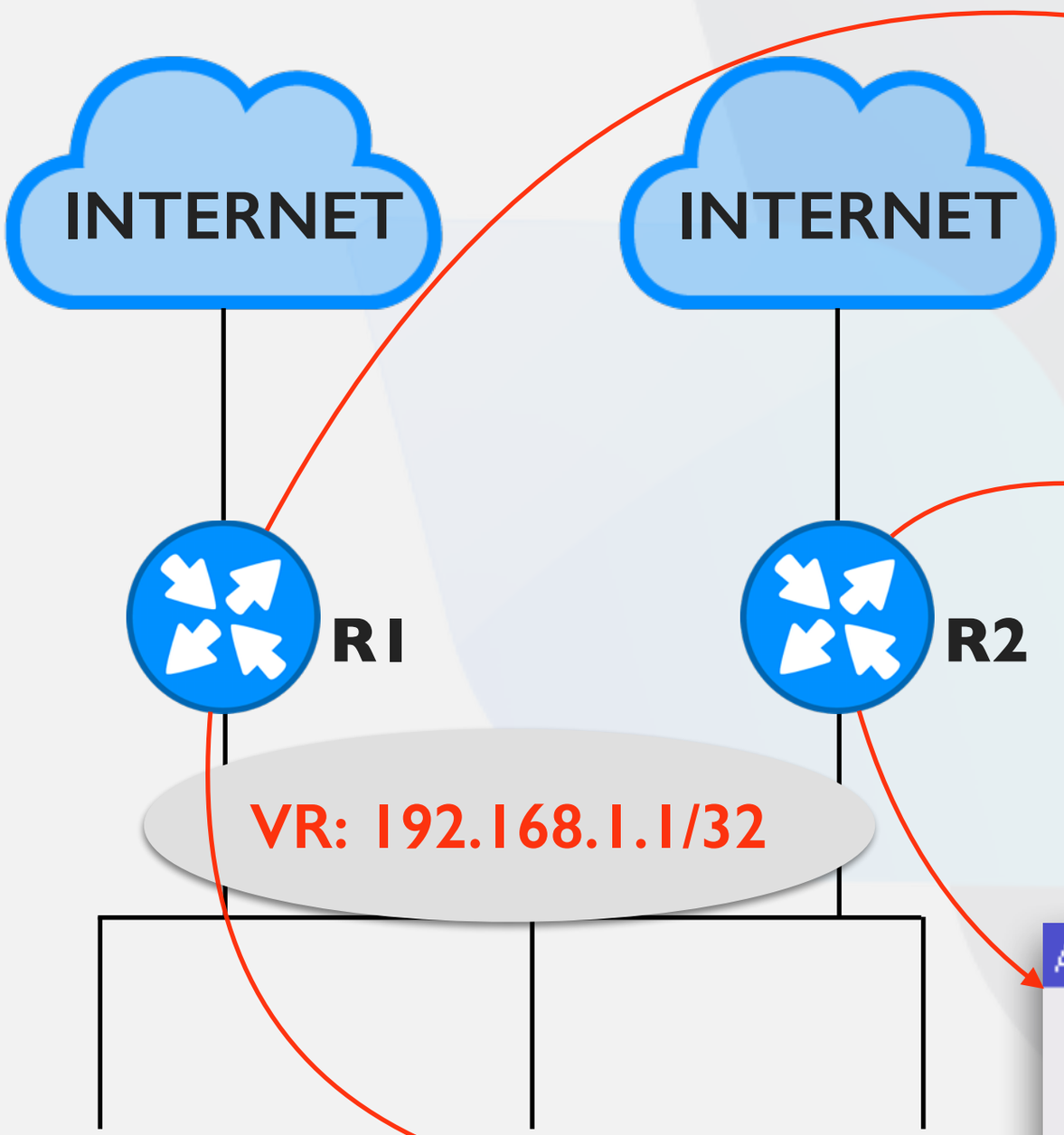


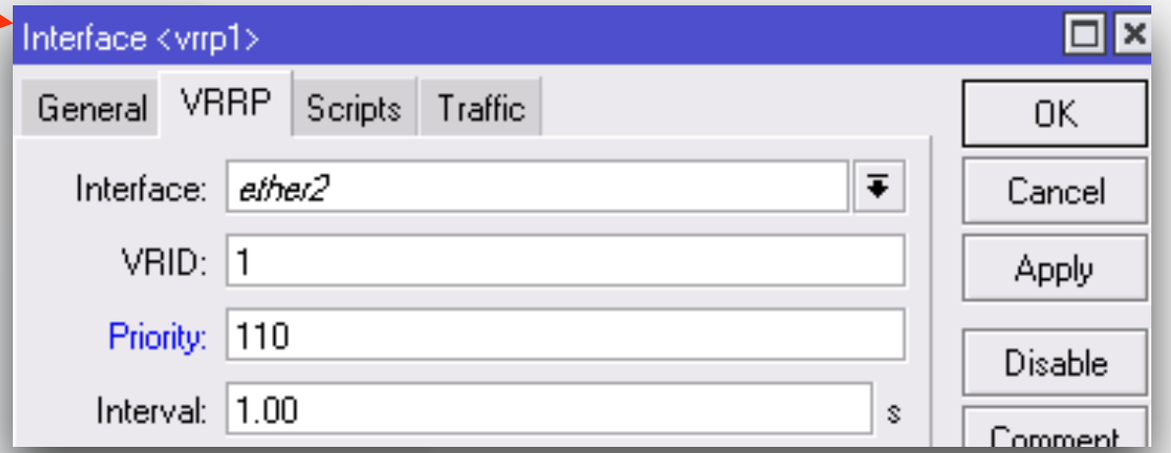


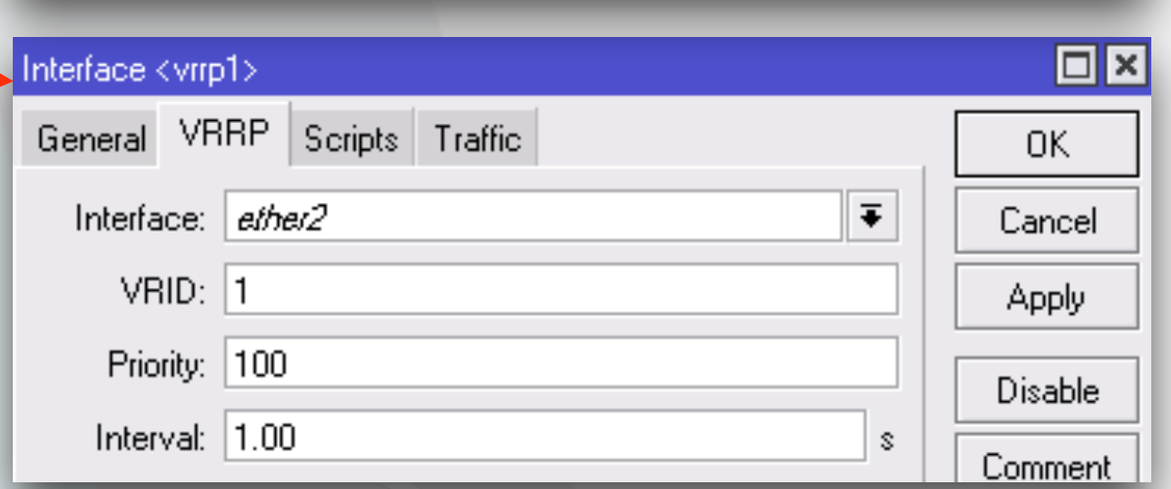


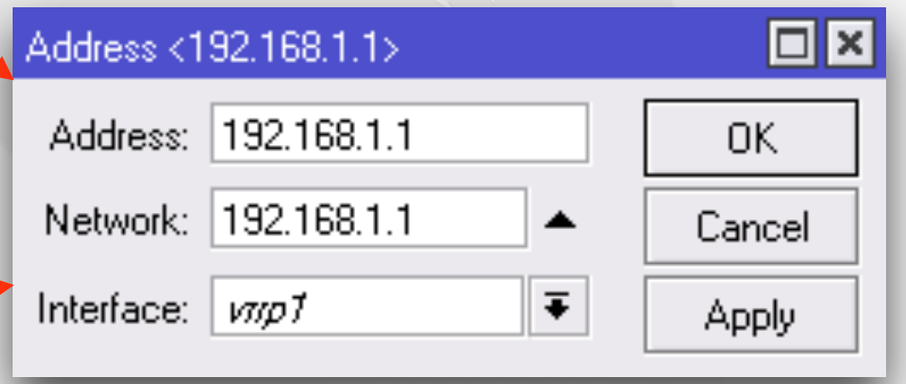
VRRP

Configuración básica - parte 2



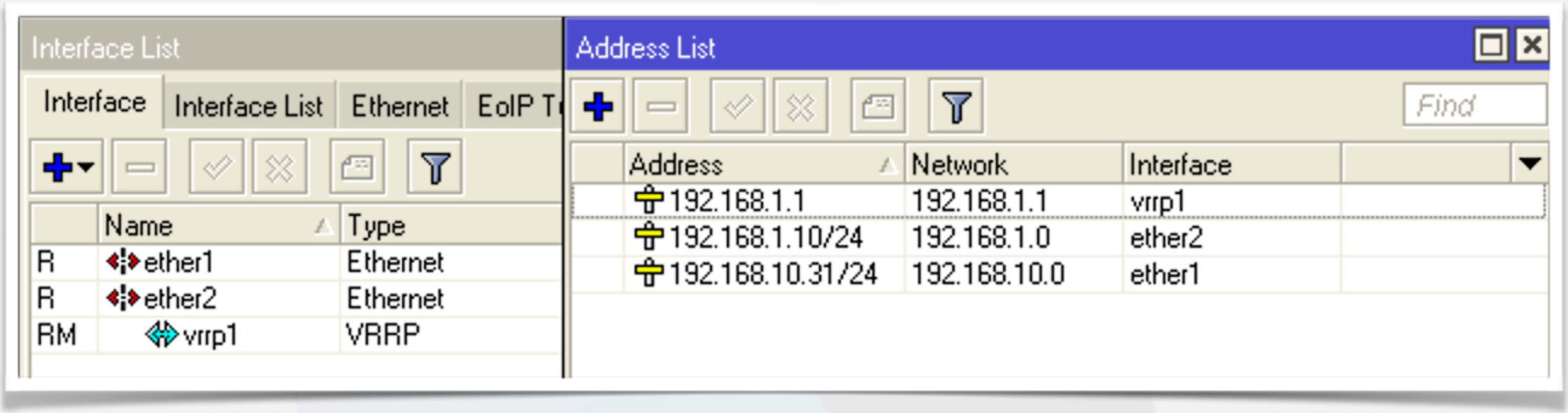




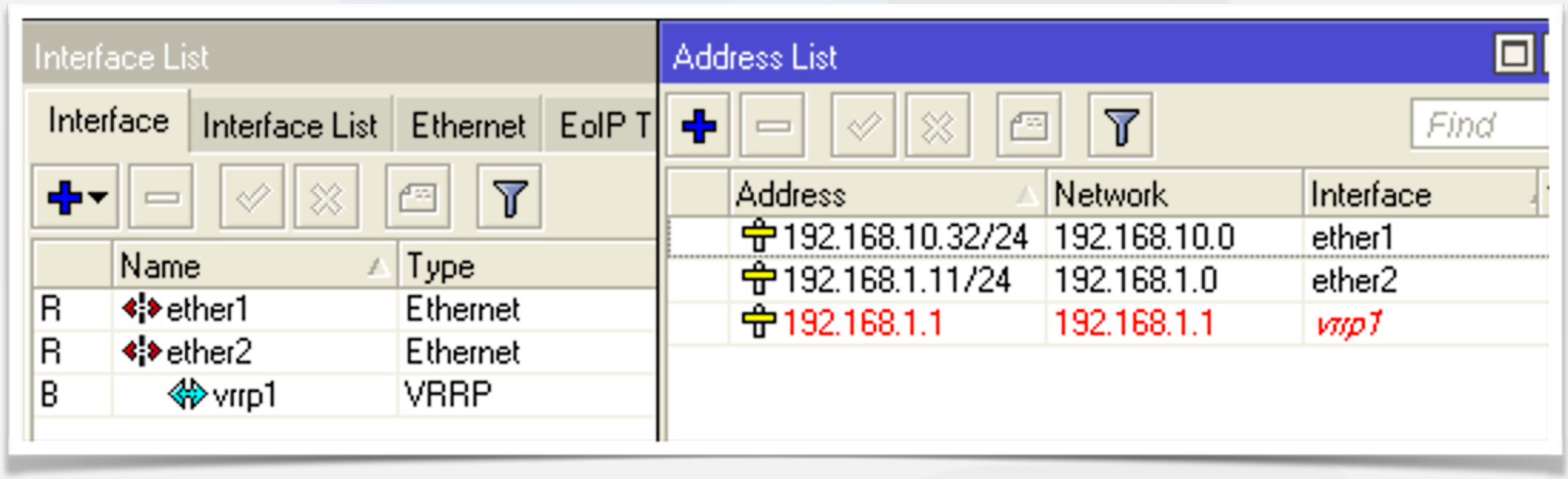


VRRP

VRRP Master



VRRP Backup



VRRP

A Saber, consideraciones:

- ***Todo el control se hace*** a través de paquetes ***multicast***, tanto en IPv4 como en IPv6.
- El ***router con mayor prioridad es*** asignado como ***master***, el resto serán ***backup*** hasta que éste falle.
- Todos los ***routers pertenecientes al mismo VR*** deben tener ***el mismo intervalo de publicación***.
- La ***dirección IP virtual debe tener máscara /32.***
- Tanto la ***IP virtual como la real, deben pertenecer al mismo segmento de red***.

Sincronización de configuraciones

Sincronización

Sincronización de Configuración

- Nos apoyaremos de un script (***cron***), que ejecutaremos cada cierto intervalo para replicar la configuración deseada en el router backup
- Este cron copiará 3 script del ***master*** al ***backup***:
  - ***clean.queue***: Limpia las reglas a importar
  - ***queue.rsc:*** Contiene las queues a importar
  - ***final.queue***: Script de finalización (opcional)

- Veamos escenario de sincronizar las ***simple queues***

https://github.com/elmaxid/vrrp_with_sync_mikrotik

Sincronización

Script: *clean.queue*

```
:log warning "----------------INICIANDO IMPORTACION ----------------------";
:log info "Limpiando queues";
/queue simple remove [find];
:delay 3s;
:log info "Listo!";
:log warning "Esperando archivo de importacion final >>>>>";
```

Script: *final.queue*

```
:log info "Listo!";
:log warning "----------------IMPORTACION FINALIZADA ----------------------";
```

Sincronización

Script en Master: *cron*

```
:log info "INICIO DE BACKUP";
:log info "Guardando queues";

/queue simple export file="queue";
:delay 5s;
:log info "Listo.!";
:log info "Limpiando reglas Router Slave";

/tool fetch address=192.168.1.10 user=ftp password=ftp123 \
   src-path=clean.queue mode=ftp upload=yes dst-path=clean.auto.rsc ;
:delay 5s;
:log info "Listo.!";
:log info "Actualizando Router Slave";
/tool fetch address=192.168.1.10 user=ftp password=ftp123 \
   src-path=queue.rsc mode=ftp upload=yes dst-path=queue.auto.rsc ;
:delay 5s;
/tool fetch address=192.168.1.10 user=ftp password=ftp123 \
    src-path=final.queue mode=ftp upload=yes dst-path=final.auto.rsc ;
:log info "Actualizado!";
```

Sincronización

Queues en VRRP Master y Backup

Queue List

Simple Queues | Interface Queues | Queue Tree | Queue Types

Reset Counters | 00 Reset All Counters

#		Name	Target	Upload Max Limit	Download Max Limit	Packet Marks
0		Server Mailserver	192.168.50.2	5M	5M	
1		Webserver	192.168.50.5	5M	5M	
2		Asterisk	192.168.50.7	5M	5M	

Queue List

Simple Queues | Interface Queues | Queue Tree | Queue Types

Reset Counters | 00 Reset All Counters

#		Name	Target	Upload Max Limit	Download Max Limit	Packet Marks	Total Max Limit (b..

Sincronización

Script en Master: *log en Master*

Log

Freeze

Nov/03/2017 21:44:24	memory	system, info	log action changed by admin
Nov/03/2017 21:44:26	memory	system, info	undo: log action changed by admin
Nov/03/2017 21:44:29	memory	system, info, account	user admin logged out via local user admin logged out via local
Nov/03/2017 21:44:36	memory	script, info	INICIO DE BACKUP
Nov/03/2017 21:44:36	memory	script, info	Guardando queues
Nov/03/2017 21:44:41	memory	script, info	Listo.!
Nov/03/2017 21:44:41	memory	script, info	Limpiando reglas Router Slave
Nov/03/2017 21:44:50	memory	script, info	Listo.!
Nov/03/2017 21:44:50	memory	script, info	Actualizando Router Slave
Nov/03/2017 21:44:57	memory	script, info	Actualizado!

Script en Backup: *log en backup*

Log

Freeze

Nov/03/2017 20:26:45	memory	script, info	Listo!
Nov/03/2017 20:26:45	memory	script, warning	----------IMPORTACION FINALIZADA ----------
Nov/03/2017 20:26:46	memory	system, info, account	user ftp logged out from 192.168.168.11 via ftp
Nov/03/2017 20:28:58	memory	vrrp, info	vrrp1 now MASTER, master down timer
Nov/03/2017 20:29:04	memory	vrrp, info	vrrp1 now BACKUP, got higher priority 110 from 192.168.168.11
Nov/03/2017 21:29:36	memory	system, info, account	user admin logged out from 14:10:9F:D5:7B:05 via winbox
Nov/03/2017 21:40:26	memory	system, info, account	user admin logged in via local
Nov/03/2017 21:40:53	memory	system, info, account	user admin logged in from 14:10:9F:D5:7B:05 via winbox
Nov/03/2017 21:41:41	memory	system, info	simple queue removed by admin
Nov/03/2017 21:41:41	memory	system, info	simple queue removed by admin
Nov/03/2017 21:41:41	memory	system, info	simple queue removed by admin
Nov/03/2017 21:42:26	memory	system, info, account	user ftp logged in from 192.168.168.11 via ftp
Nov/03/2017 21:42:26	memory	script, warning	----------INICIANDO IMPORTACION ----------
Nov/03/2017 21:42:26	memory	script, info	Limpiando queues
Nov/03/2017 21:42:29	memory	script, info	Listo!
Nov/03/2017 21:42:29	memory	script, warning	Esperando archivo de importacion final >>>>>
Nov/03/2017 21:42:29	memory	system, info, account	user ftp logged out from 192.168.168.11 via ftp
Nov/03/2017 21:42:34	memory	system, info, account	user ftp logged in from 192.168.168.11 via ftp
Nov/03/2017 21:42:34	memory	system, info	simple queue added by ftp
Nov/03/2017 21:42:34	memory	system, info	simple queue added by ftp
Nov/03/2017 21:42:34	memory	system, info	simple queue added by ftp
Nov/03/2017 21:42:35	memory	system, info, account	user ftp logged out from 192.168.168.11 via ftp
Nov/03/2017 21:42:40	memory	system, info, account	user ftp logged in from 192.168.168.11 via ftp
Nov/03/2017 21:42:40	memory	script, info	Listo!
Nov/03/2017 21:42:40	memory	script, warning	----------IMPORTACION FINALIZADA ----------
Nov/03/2017 21:42:41	memory	system, info, account	user ftp logged out from 192.168.168.11 via ftp
Nov/03/2017 21:42:40	memory	script, info	Listo!
Nov/03/2017 21:42:40	memory	script, warning	----------IMPORTACION FINALIZADA ----------
Nov/03/2017 21:42:41	memory	system, info, account	user ftp logged out from 192.168.168.11 via ftp

Sincronización

Queues en Master y Backup

Queue List

Simple Queues | Interface Queues | Queue Tree | Queue Types

Reset Counters | 00 Reset All Counters

#		Name	Target	Upload Max Limit	Download Max Limit	Packet Marks	To
0		Server ...	192.168....	5M	5M		
1		Webser...	192.168....	5M	5M		
2		Asterisk	192.168....	5M	5M		

Queue List

Simple Queues | Interface Queues | Queue Tree | Queue Types

Reset Counters | 00 Reset All Counters

#		Name	Target	Upload Max Limit	Download Max Limit	Packet Ma
0		Server Mailserver	192.168.50.2	5M	5M	
1		Webserver	192.168.50.5	5M	5M	
2		Asterisk	192.168.50.7	5M	5M	

Referencias

Sitios y bibliografia:

- ***VRRP:*** https://wiki.mikrotik.com/wiki/Manual:Interface/VRRP
- ***Scripts:*** https://github.com/elmaxid/vrrp_with_sync_mikrotik

Presentaciones MUMs:

- *Redundancia de Routers con VRRP*
  - Mario Clep - MUM Lima, Perú 2012
  - https://mum.mikrotik.com/presentations/PE12/marioclep.pdf

¿Preguntas?

MUCHAS GRACIAS!

Maximiliano Dobladez

MKE Solutions

info@mkesolutions.net - http://www.mkesolutions.net

http://maxid.com.ar

http://twitter.com/mdobladez