MUM MikroTik User Meeting

Alta Disponibilidad con VRRP y Sincronización de configuración

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Montevideo - Uruguay

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Presentación Personal

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- Consultor y Entrenador ***MikroTik RouterOS***
- Experiencia con *MikroTik RouterOS* desde 1999
- Entrenador desde 2006

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MKE Solutions

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- Soporte mensual (OutSourcing).
  - Revisión y Optimización
  - Actualización
  - Mantenimiento preventivo
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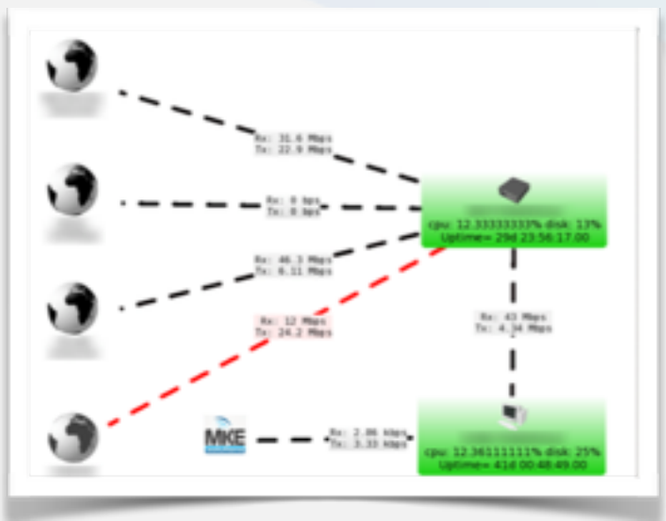
  - Asesoramiento
  - Soporte Prioritario
  - Guardia 24x7
  - Implementaciones Adicionales



MUM Oráculo

Overview | Graphs | Interfaces | Firewall | Logs | Files | History | >_

Binary | Export | Probe | Clean | Delete

MikroTik - *CCR1036-12G-4S* — ***v6.36.3 (stable)***

Device Name:	[redacted]
Category / Group:	[redacted]
IP Address:	1.1.2.128
Host Alive:	OK
Last Seen Alive:	33 seconds
Uptime:	00:29:36 (1776 secs)
Uptime (Reboot) Counter:	7 (Last Reset: September 20)

Cron Details

Last Probe:	47 seconds
Last Job Status:	Warning
Log Probe:	
Last Checked:	33 seconds
Last Time Modify Event:	25 minutes ago
Last Backup Export:	08 de Noviembre de 2017
Last Backup Binary:	08 de Noviembre de 2017

Hardware Details

System License	**DJN2-SXLD / Level 6**
Connection Tracking	Actual: **1482** / Max: **524288**

RouterBOARD

Architecture-name:	tile
Current-firmware:	3.33
Factory-firmware:	3.27
Firmware-type:	tilegx

System Resources

Memory Used (2.29%): 371.8 MiB/15.9 GiB

Disk Used (13.87%): 142.1 MiB/1 GiB

CPU Load (0%): 36 core / 1200Ghz

cpu0: %	cpu1: %	cpu2: %	cpu3: 3%	cpu4: %
cpu5: %	cpu6: %	cpu7: %	cpu8: %	cpu9: %
cpu10: %	cpu11: %	cpu12: %	cpu13: %	cpu14: %
cpu15: %	cpu16: %	cpu17: %	cpu18: %	cpu19: %
cpu20: %	cpu21: %	cpu22: %	cpu23: %	cpu24: %
cpu25: %	cpu26: %	cpu27: %	cpu28: %	cpu29: %
cpu30: %	cpu31: %	cpu32: %	cpu33: %	cpu34: %
cpu35: %	CPU_total: 0.08%			

Interfaces Static

ether: 16 | pptp-out: 1 | vlan: 2

ether1 ether2 ether3 ether4 ether5 ether6 ether7 ether8 ether9 ether10 ether12 sfp1 sfp2 sfp3 sfp4 MKE-Support vlan.61_-_Internet vlan.62_-_Telefonia

2 Ethernet Link | 14 Ethernet No Link | 16 Ethernet Total

BGP

BGP Peers (6)

Peer	Remote Address	Remote AS	Updates Received	Updates Sent
to-metrotel	[redacted]	4	7	21
to-iplan	[redacted]	4	1	21
ibgp-metrotel	[redacted]	39	88525	19

Device's Events - Showing last 5 events

Type	Date	Category	Description
INFO	8 hours ago	Interface	Change for Interface ether2 Value (link-downs)
WARNING	Monday at 11:20am	Ping	Device is **DOWN** since 6 minutes ago
WARNING	November 4	Ping	Device is **DOWN** since 5 minutes ago
INFO	November 4	Interface	Change for Interface ether8 Value (link-downs)
WARNING	November 4	Ping	Device is **DOWN** since 5 minutes ago

Monitor: Uptime Activity

Start	Duration	Status
2017-11-08 11:53:25	28 minutes	UP
2017-11-08 11:52:26	3 minutes	DOWN
	1 hours 9 minutes	UP
	4 minutes	DOWN
	1 days 1 hours 54 minutes	UP
	near a minute	DOWN
	8 minutes	UP
	1 minutes	DOWN
	days 9 hours 19 minutes	UP

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Agenda

Desarrollo de la presentación:

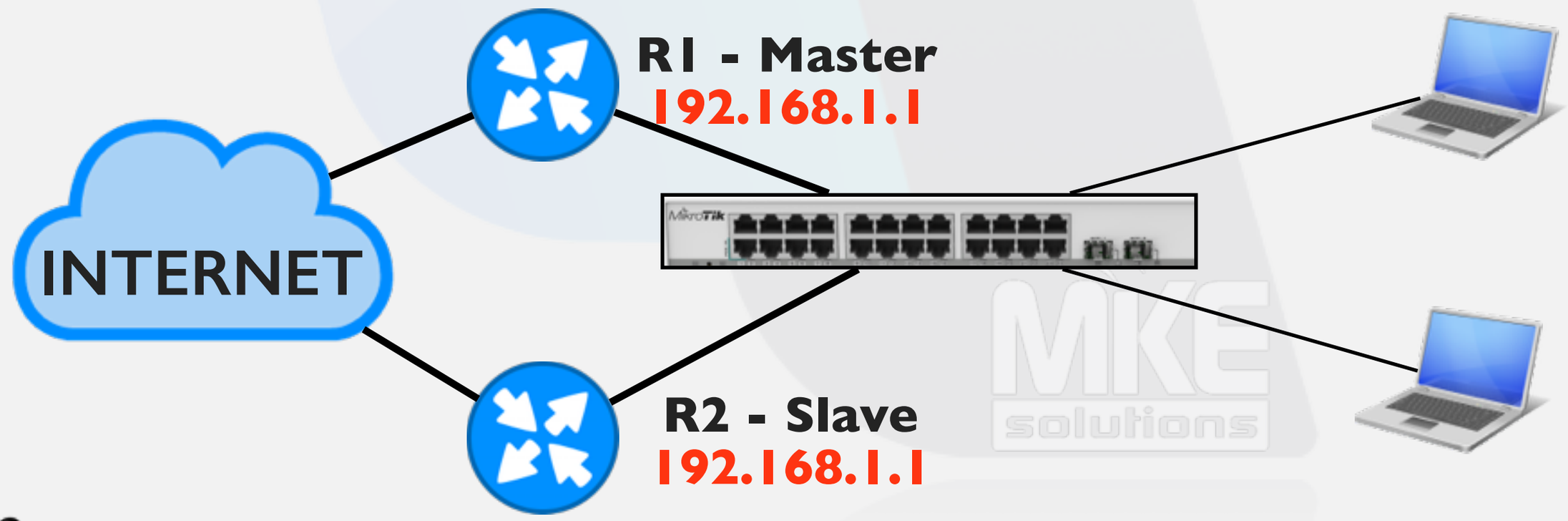
Conceptos Iniciales:

- **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.



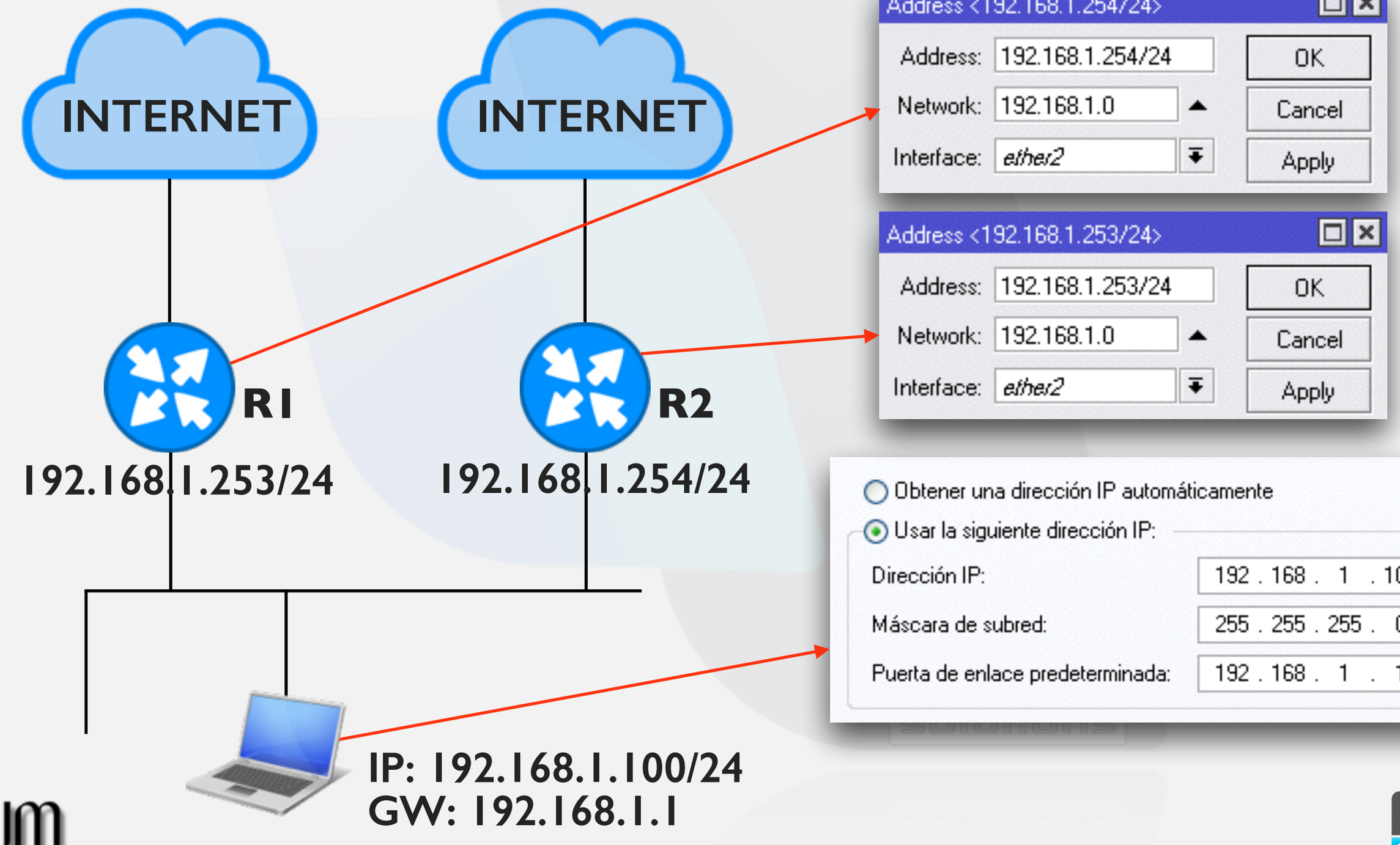
VRRP

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.***

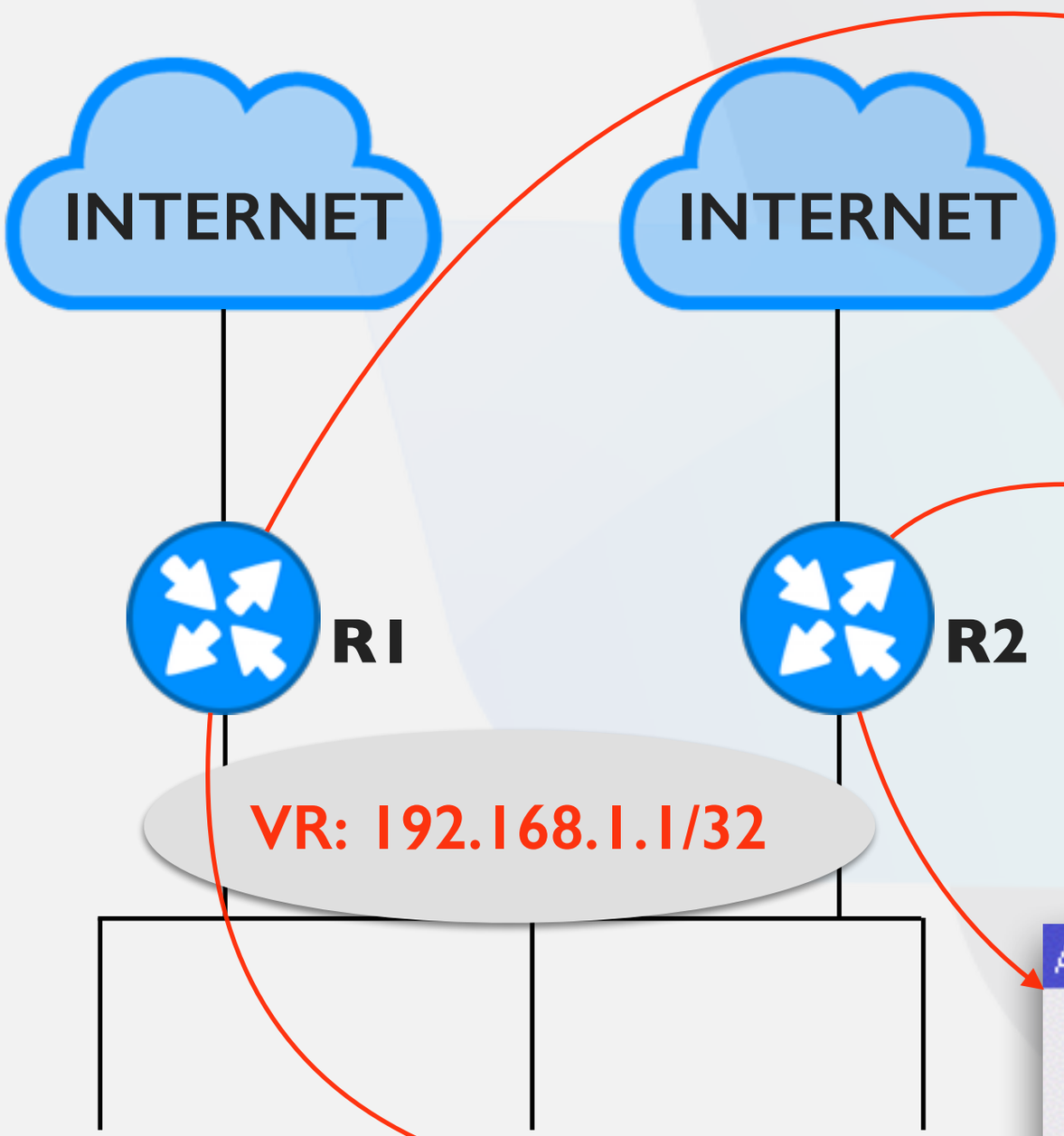
VRRP

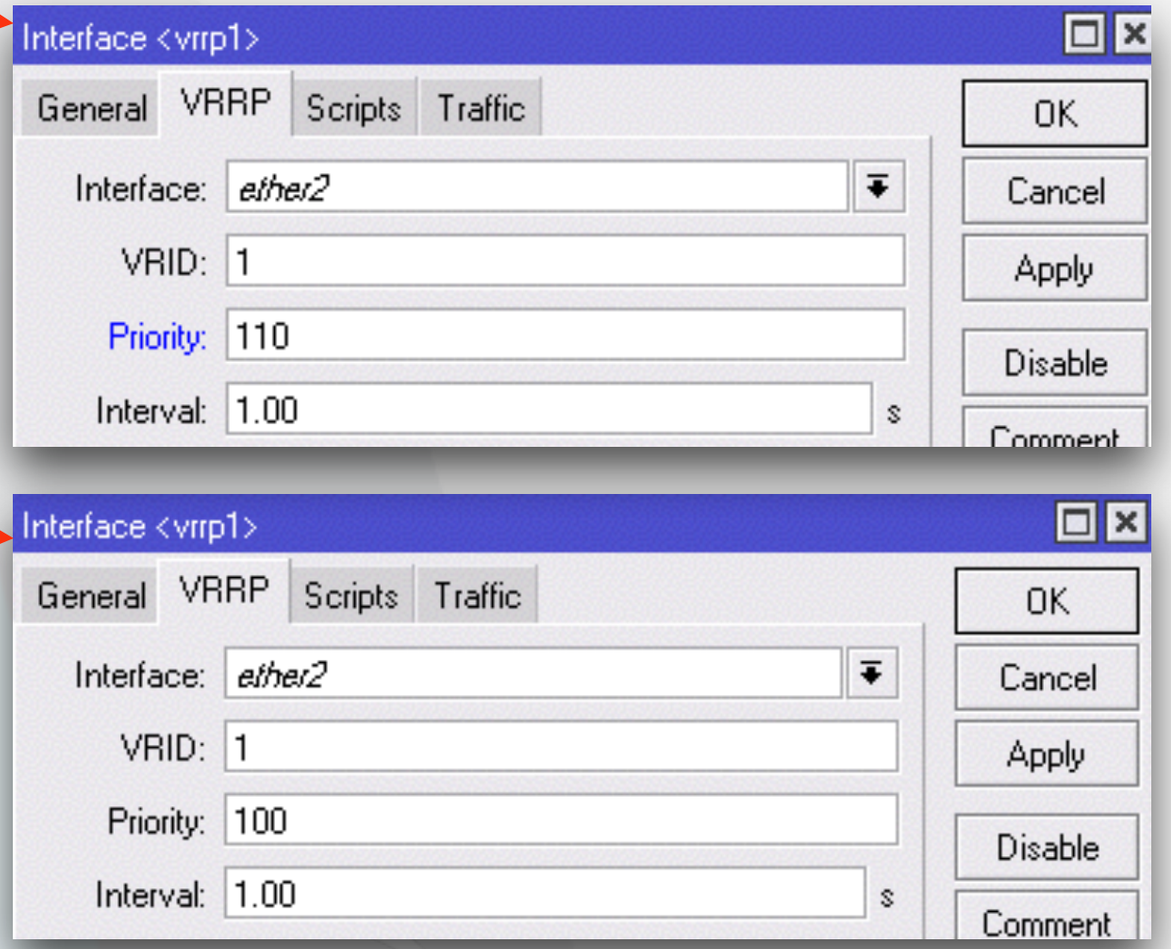
Configuración básica - parte 1

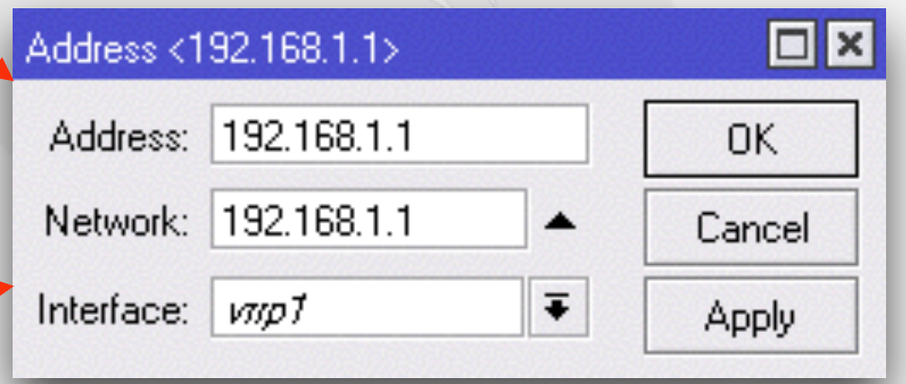


VRRP

Configuración básica - parte 2







VRRP

VRRP Master

Interface List

	Name	Type
R	ether1	Ethernet
R	ether2	Ethernet
RM	vrrp1	VRRP

Address List

	Address	Network	Interface
D	192.168.10.31/24	192.168.10.0	ether1
	192.168.168.1	192.168.168.1	vrrp1
	192.168.168.11/24	192.168.168.0	ether2

VRRP Backup

Interface List

	Name	Type
R	ether1	Ethernet
R	ether2	Ethernet
B	vrrp1	VRRP

Address List

	Address	Network	Interface
D	192.168.10.32/24	192.168.10.0	ether1
	192.168.168.1	192.168.168.1	vrrp1
	192.168.168.10/24	192.168.168.0	ether2

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=192.168.168.10 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=192.168.168.10 user=ftp password=ftp123 \
   src-path=queue.rsc mode=ftp upload=yes dst-path=queue.auto.rsc ;
:delay 5s;
/tool fetch address=192.168.168.10 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..

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!

Sincronización

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

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!

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