A redundant router for $79,90

[and without using any special offer...]

by Lorenzo Busatti
About me

Lorenzo Busatti

Grifonline S.r.l., Grosseto – ITALY

ISP for more 15 years, WISP for more 6 years

MikroTik Certified Trainer / Consultant

• For: MTCNA, MTCWE, MTCRE, MTCTCE, MTCUME, MTCINE

• Specialization: Wireless, Routing
The task

In every company or office can be useful to reduce failures for the internet gateway, or main router, commonly caused by:

• Router maintenance;
• Router hardware failure;
• ISP failure;
• Etc.
The task

You can use at least two ISP;

You can buy an expensive redundant router, with power supply failover, and different optionals available .... or
The RB750

- 5x 10/100 ports
- RouterOS level 4
- MPLS capable
- 445 Mbps Throughput*

$ 39,95

* w/firewall, w/conntrack, in routing, 1518 bytes frames
Two RB750
As ONE Virtual Router
Using V.R.R.P.

ISP “A”

ISP “B”

2x RB750 = $ 79,90
From the MikroTik Wiki:

V.R.R.P.
[vi: a:/ar a:/ar pi:] Acronym

Virtual Router Redundancy Protocol (VRRP) provides a solution by combining number of routers into logical group called Virtual Router (VR).

[VRRPv2 RFC 3768 and VRRPv3 RFC 5798]

http://wiki.mikrotik.com/wiki/VRRP
The VR

VR = Virtual Router

ISP “A”

ISP “B”

RB750

RB750

LAN
Logical Vs Physical

VR = Virtual Router

ISP “A”

ISP “B”

RB750

RB750

LAN
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VR = Virtual Router

ISP “A”

ISP “B”

RB750

LAN

RB750

LAN
Logical Vs Physical

VR = Virtual Router

ISP “A”

ISP “B”

RB750

RB750

LAN
About V.R.R.P.

The purpose of the VRRP is to communicate to all VRRP routers.

They are associated with the Virtual Router ID and support router redundancy through a prioritized election process among them.
About V.R.R.P.

VRRP allows to detect unreachable router within 3 seconds without additional traffic overhead.

Static multiple routes or dynamic protocols like OSPD are not needed.
Virtual Router is defined by VRID and mapped set of IPv4 or IPv6 addresses.

Each VR node has a single assigned MAC address.

This MAC address is used as a source for all periodic messages sent by Master.
Selection of the Master

The selection of the Master router is controlled by priority value.

Higher number means higher priority.
Selection of the Master

Only Master router is sending periodic Advertisement messages to minimize the traffic.
VRRP States

Init. State

Master State  ←  Backup State
VRRP Settings
VRRP Settings
VRRP Live Demo
The VRRP Live Lab Setup

ISP1

R1

vrID: 49
vrPRI: 254
vrIP: 10.10.10.1/32
IP: 10.10.10.2/24
DHCP server

ISP2

R2

vrID: 49
vrPRI: 100
vrIP: 10.10.10.1/32
IP: 10.10.10.3/24
DHCP server

LAN

RB751U-2HnD
As transparent Access Point (AP Bridge)
SSID: VRRP Lab - MUM UAE
VRRP Live Demo

You can participate at this Live Lab:

Connect now with your device at the SSID

VRRP Lab - MUM UAE

Then browse a website or ping a public host
The VRRP Live Lab Setup

Now I’ll turn off the R1, the actual Master.

R2 will be the new Master.
The VRRP Live Lab Setup

ISP1
- vrID: 49
- vrPRI: 254
- vrIP: 10.10.10.1/32
- IP: 10.10.10.2/24
- DHCP server

R1
- Master

ISP2
- vrID: 49
- vrPRI: 100
- vrIP: 10.10.10.1/32
- IP: 10.10.10.3/24
- DHCP server

R2
- Backup <- Master

LAN

RB751U-2HnD
- As transparent Access Point
- (AP Bridge)
- SSID: VRRP Lab - MUM UAE

Now I’ll turn on the R1. He will be the Master again.
Preemption

Whether master node always has the priority.

When set to 'no' backup node will not be elected to be a master until the current master fails, even if the backup node has higher priority than the current master.
Preemption
The Preemption Live Lab

I’ll change the preemption settings in both routers.

I’ll turn off the R1, the actual Master.

R2 will be the new Master.

ISP1

Master

vrID: 49
vrPRI: 254
vrIP: 10.10.10.1/32
IP: 10.10.10.2/24
DHCP server

ISP2

Backup -> Master

vrID: 49
vrPRI: 100
vrIP: 10.10.10.1/32
IP: 10.10.10.3/24
DHCP server

RB751U-2HnD
As transparent Access Point (AP Bridge)
SSID: VRRP Lab - MUM UAE

LAN

R1

R2
The Preemption Live Lab

ISP1

R1

vrID: 49
vrPRI: 254
vrIP: 10.10.10.1/32
IP: 10.10.10.2/24
DHCP server

Master -> Backup

ISP2

R2

vrID: 49
vrPRI: 100
vrIP: 10.10.10.1/32
IP: 10.10.10.3/24
DHCP server

Backup -> Master

LAN

RB751U-2HnD
As transparent Access Point (AP Bridge)
SSID: VRRP Lab - MUM UAE

Now I’ll turn on the R1.

R2 will remain the Master, even if R2 have less priority.
User notification

On Master:
- notify by email that the Master router failed
- (DO NOT use this script!!!)

On Backup:

enabled
running
slave
master
Synchronize the configurations
Synchronization

Using two routers you have to remember to manually duplicate the configuration on the backup router.
Synchronization

Or you can just use the tools that RouterOS provides you:

- Scripts;
- Scheduler (use the NTP)
- Export/Import CLI
- Fetch;
Synchronization Example

ISP1

R1

Master

Each hour export the config

ISP2

R2

Backup

Each hour download the config from R1, then

(Delete all previous config, then)

Import the new config.

LAN
Synchronization Example

On the R1:

```
ip dhcp-server lease export file=dhcp-lease
```

On the R2:

```
/tool fetch mode=ftp address=10.10.10.2 src-path=dhcp-lease.rsc user=usr password=pass
delay 2s
/ip dhcp-server lease;
    :foreach i in=[find] do={
        /ip dhcp-server lease;
        remove $i;
    }
/import dhcp-lease.rsc
```
Synchronization Live Lab

Now I’ll synchronize the DHCP statics leases.

ISP1

Master

ISP2

Backup

R1

R2

LAN

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Double Gateway

Normally the Group A will use R1 and the Group B will use R2.

In case of failure both group will use the same router.
Thankyou!

Q & A

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