USING VRRPv3 ON MIKROTIK

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About Me

PARMOHONAN HASIBUAN

- 2013 – 2014 Network Operation Center at VSAT ISP
- 2014 – 2015 Network Operation Center at WISP
- 2016 – Now Teacher at Taruna Bhakti Depok Vocational High School
- 2016 – Now MikroTik Consultant

Consultant

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About Taruna Bhakti Depok

Placed at Jl Pekapuran Kel Curug Kec Cimanggis Depok Jawa Barat
Motto : Our Quality Ask Be Different
5 Majors

1. Network Engineering
2. Software Engineering
3. Multimedia
4. Broadcasting
5. Electrical Engineering Industry

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About Taruna Bhakti Depok

What is VRRP

(Virtual Router Redundancy Protocol)

is a computer networking protocol that provides for automatic assignment of Available Internet Protocol (IP) routers to participating hosts.

This increases The availability and reliability of routing paths via automatic default gateway selections on an IP subnetwork.

High Avaibility ?

High availability refers to systems that are durable and likely to operate continuously without failure for a long time.

VRRP v3 Can Implement for IPv4 and IPv6

VRRPv2 VS VRRPv3

Parameter	VRRPv2	VRRPv3
RFC	RFC 3768 (http://tools.ietf.org/html/rfc3768)	RFC 5798 (http://tools.ietf.org/html/rfc5798)
Protocol Supported	Support for IPV4 only.	Supports both IPv4 and IPv6
Timers	Timers in seconds	Timers in Milliseconds
Multicast Address	224.0.0.18 for IPv4 address	224.0.0.18 for IPV4 FF02:0:0:0:0:0:0:12 for IPv6
Virtual Router-ID	**IPv4** – Uses mac address 0000.5E00.01xx, where xx is the virtual router id in hexadecimal	**IPv4** – Uses mac address 0000.5E00.01xx, where xx is the virtual router id in hexadecimal **IPv6** – The multicast address FF02::12 is used to send hello messages.
Preemption criteria	Node with same priority value but higher IP would cause preemption.	Only higher priority would cause preemption
Enable VRRP	Enabled on per interface basis.	Need to be enabled globally

How About IPv6

Hexadecimal values of eight 16 bit fields separated by colon

abcd:0000:0000:0000:0000:0000:0000:0001

1 2 3 4 5 6 7 8

- 128 bit
- 340 undecillion (10^36) ip address
- 8 field
- 16 bit on each field
- Use hexadecimal (0-9, A-F)
- Separated by ":" (colon)

How to Simplify IPv6 Addresses

abcd:0000:0000:0000:0000:0000:0000:0001

After ↓ ↑ Before

abcd::1

Tips n Trick IPv6

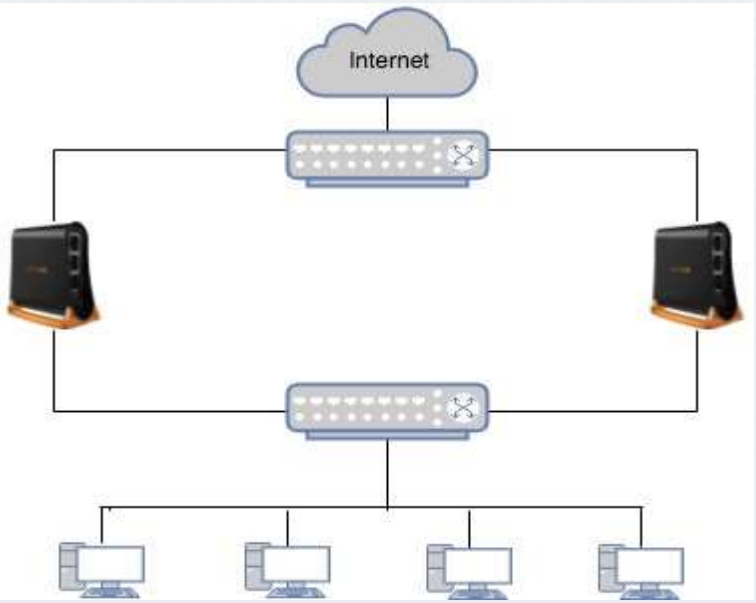
Double Colon can be used only once

Example

abcd:0098:0000:0000:0000:1234:0000:5678

Wrong	Correct
abcd:0098::1234::5678	abcd:0098::1234:0:5678

Topology



Virtual Router

A Virtual Router (VR) consists of one Owner router and one or more backup routers belonging to the same network.

VR includes:

- VRID configured on each VRRP router
- the same virtual IP on each router
- Owner and Backup configured on each router. On a given VR there can be only one Owner

Virtual MAC address

VRRP automatically assigns MAC address to VRRP interface based on standard MAC prefix for VRRP packets and VRID number. First five octets are 00:00:5E:00:01 and last octet is configured VRID. For example, Virtual Routers VRID is 20, then virtual MAC address will be *00:00:5E:00:01:14*.

Note: Virtual mac address can not be manually set or edited.

Don’t Forget

Master & Backup

Master

Master router in a VR operates as the physical gateway for the network for which it is configured. Master selection by priority value.

Backup

VR must contain at least one backup router. Virtual IP must same. VR Priority backup is 100.

Virtual Address

- Virtual IP associated with VR must be identical and set on all VR nodes
- All virtual and real addresses should be from the same network.

IPv4 VS IPv6

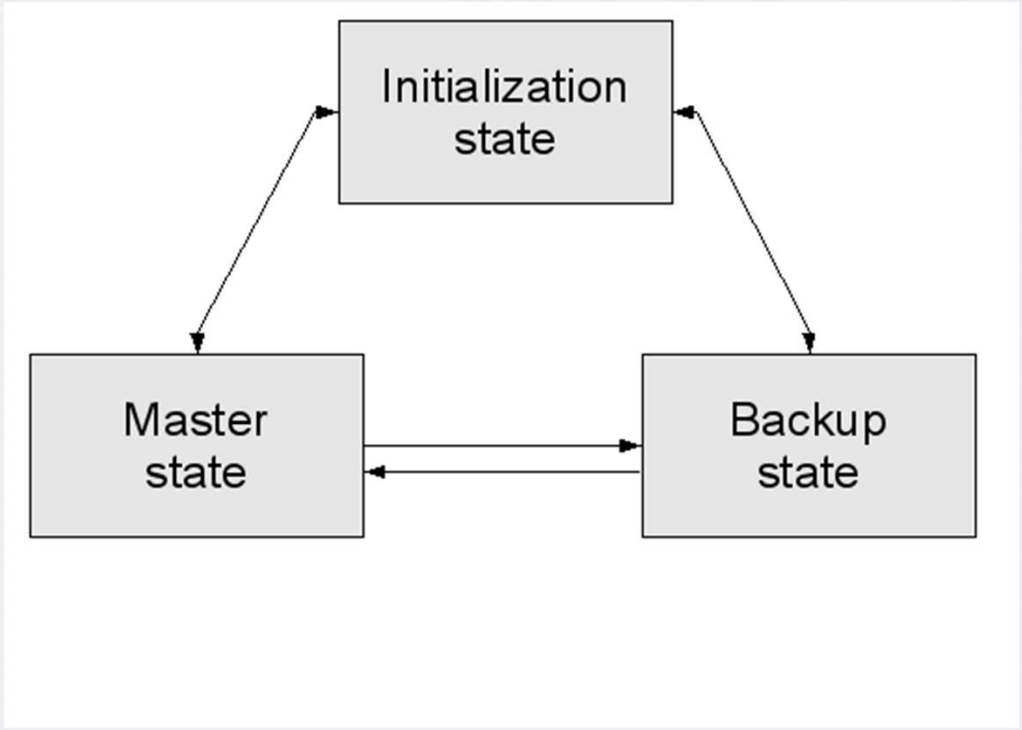
IPv4 ARP

The Master for a given VR responds to ARP requests with the VR's assigned MAC address.

IPv6 ND

As you already know there are no ARP in IPv6 networks, routers are discovered by Neighbor Discovery protocol.

VRRP State



Configuration

MikroTik-1

- /ipv6 address add address=2018::1/64 interface=ether1 advertise=yes
- /interface vrrp add name=vrrp1 vrid=20 priority=254 interface=ether1 version=3 v3-protocol=ipv6
- /ipv6 address add address=2018::/64 advertise=yes interface=vrrp1

MikroTik-2

- /ipv6 address add address=2018::2/64 interface=ether5 advertise=yes
- /interface vrrp add name=vrrp1 vrid=20 interface=ether5 version=3 v3-protocol=ipv6
- /ipv6 address add address=2018::/64 advertise=yes interface=vrrp1

Result

MikroTik-1

```
[[admin@MikroTik] > interface vrrp print detail
Flags: X - disabled, I - invalid, R - running, M - master, B - backup
 0   RM name="vrrp1" mtu=1500 mac-address=00:00:5E:00:02:14 arp=enabled
        arp-timeout=auto interface=ether1 vrid=20 priority=254 interval=1s
        preemption-mode=yes authentication=none password="" on-backup=""
        on-master="" version=3 v3-protocol=ipv6
```

MikroTik-2

```
[[admin@MikroTik] > interface vrrp print detail
Flags: X - disabled, I - invalid, R - running, M - master, B - backup
 0    B name="vrrp1" mtu=1500 mac-address=00:00:5E:00:02:14 arp=enabled
        arp-timeout=auto interface=ether5 vrid=20 priority=100 interval=1s
[       preemption-mode=yes authentication=none password="" on-backup=""
[       on-master="" version=3 v3-protocol=ipv6
```

Load Sharing

MikroTik-1

- Interface vrrp add name=vrrp2 vrid=19 interface=ether1 version=3 v3-protocol=ipv6
- Ipv6 address add address=2018::4/64 advertise=yes interface=vrrp2

MikroTik-2

- Interface vrrp add name=vrrp2 vrid=19 priority=254 interface=ether=5 version=3 v-3-protocol =ipv6
- Ipv6 address add address=2018::4/64 advertise=yes interface=vrrp2

Question

Conclusion

You must think how about make your "networking" stable

It’s Me

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Scan Me