MikroTik RouterOS v3

New
Obvious and Obscure
Mikrotik RouterOS v3.0 features

Kernel

- RouterOS 2.9.39
  - Linux kernel version 2.4.31
- RouterOS 3.0beta5
  - Linux kernel version 2.6.19

- For more detailed information see:
  http://www.kernel.org/

Hardware compatibility

- SMP (Symmetric Multiprocessing) support

- SATA (Serial-ATA) disk support

- Maximum RAM support increased from 1GB to 2GB

- Latest interface driver support

- Dropped legacy interface support

API support

- An application programming interface (API) is a source code interface that a computer system provides in order to support requests for services to be made of it by a computer program. (from wikipedia.org)

- To enable API use "/ip services enable api"

- Default RouterOS API port is 8728 TCP.

- For more information see:
  http://wiki.mikrotik.com/wiki/API

New web-proxy implementations

- Completely Mikrotik rewritten web-proxy (no Squid or another pre written source code used)

- Web-proxy package is now fully integrated into main system package

- Web-proxy now is more suitable for Hotspot use

- Web-proxy now works faster and have optimized memory usage

New OSPF implementation

- Completely Mikrotik rewritten OSPF (no Zebra or another pre written source code used)

- Completely new routing-test v3.0 package created (routing-test v2.9 package is now standard routing v3.0 package)

- Several previously unfixable bugs fixed

- OSPF now have potential for further improvements (interface routes, inter-area filters, pre-interface filters, ...)

Wireless Features

- "MAC NAT" bridge

  - Station-pseudobridge

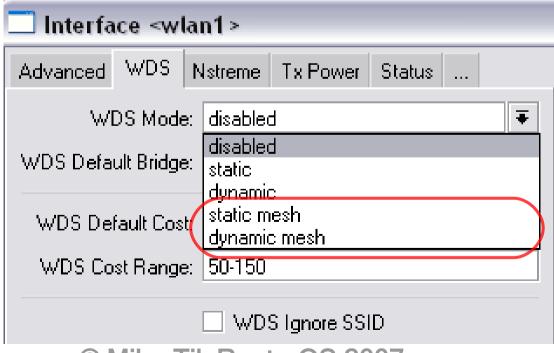   Learns which IP address has which MAC address and translates it.

  - Station-pseudobridge-clone

    Uses one MAC address of the device and clones it to the wireless interface.

Wireless Features

- ## WDS-MESH

  - ### WDS-mode=dynamic-mesh/static-mesh
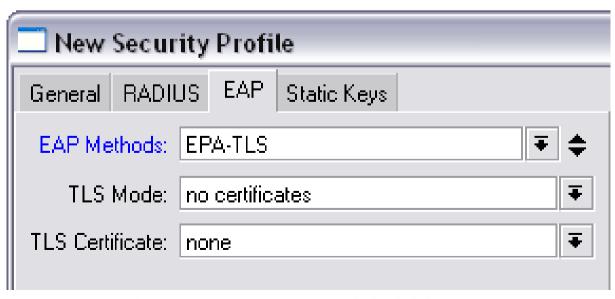
    New improved WDS connection between RouterOS devices for MESH networking.

Wireless Features

- WPA2 Pairwise Master Key caching

    - 802.11i optional feature

        Increased the speed of the EAP authentication; Useful to decrease the CPU usage when tls-mode=no-certificate is used.

Wireless Features

- Access-list
  - Entries are ordered now, just like in firewall
  - Matching by all interfaces "interface=all"
  - "Time" - works just like in firewall
  - "Signal-range" - clients signal should be within this range to match the rule. If the signals goes outside the range, it will be disconnected.
  - "Private-pre-shared-key" - each client can have different key; works only when PSK method is used

Wireless Features

Wireless Features

- ## Connect-list

  - "Signal-range" - client will connect to the AP which will be within this signal range. If the signal goes out the range client will disconnect from AP and start to look for a new AP by checking the connect-list entries.

- ## Nstreme

  - Improved performance on lower speed boards (RB100 Series)

  - "Disable-csma" - disables the "medium access" protocol if the polling is enabled

Wireless Features

- Security-profile
  - "Radius-mac-accounting" - MAC address uses as user-name
  - "Radius-eap-accounting" - EAP supplicant-identity used as user-name
  - "Radius-mac-format" - which format should be used to code clients MAC address
  - "Radius-mac-mode" - where to put the MAC address "as-username" or "as-username-and-password"

Wireless Features

- Security-profile

User Manager

- User Authorization using MSCHAPv1,MSCHAPv2
- User status page
- User sign up system
- Support for decimal places in credits
- Authorize.net payment gateway support
- Database backup feature
- License changes in RouterOS v3.0 for active users:
  - Level3 – 10 active users
  - Level4 – 20 active users
  - Level5 – 50 active users
  - Level6 – Unlimited active users

The Dude

- RouterOS package – works as dude server

- Speed improvements between server/client

- Dude Agents to reach private networks and offload service monitoring

- Reports from any list/table

- Support for SNMP v3

Console: Colors

```
[admin@RB_7] > interface export
# jan/01/2000 00:26:40 by RouterOS 3.0beta5
# software id = RD45-3TT
#
/interface ethernet
set 0 arp=enabled auto-negotiation=yes cable-settings=default comment="" disable-running-check=yes \
    disabled=no full-duplex=yes mac-address=00:0C:42:0D:4B:37 mtu=1500 name="ether1" speed=100Mbps
set 1 arp=enabled auto-negotiation=yes cable-settings=default comment="" disable-running-check=yes \
    disabled=no full-duplex=yes mac-address=00:0C:42:0D:4B:38 mtu=1500 name="ether2" speed=100Mbps

[admin@RB_7] > :put "NAme : $[/system identity get name]\r\nOk"
NAme : RB_7
Ok
[admin@RB_7] > error
```

- Console consumes less memory, it has faster startup and first export time

- References to items, commands, prompts and exports are coloured

- Currently no way to turn colours off, except running under dumb terminal

Multi-line commands

```
[admin@r4] > :put [
line 2 of 2>          /system \
line 3 of 3>                package \
line 4 of 4> get system version]
3.0beta5
```

- If input line ends with backslash, or has unclosed braces / brackets /quotes / parentheses, then next line is automatically prompted

- Prompt shows "line N of M>" if editing multi-line command

- History walks through multi-line commands line-by-line

Scripting

```
[admin@RB_7] > :global conntrack [:parse "/i f c t p"]
[admin@RB_7] > $conntrack
bad command name i (line 1 column 2)
[admin@RB_7] > :global conntrack [:parse "/ip f c t p"]
[admin@RB_7] > :environment pr
Global Variables
"conntrack"=>{[/ip firewall connection tracking print]}

Automatic Variables

[admin@RB_7] > $conntrack
                    enabled: yes
       tcp-syn-sent-timeout: 5s
   tcp-syn-received-timeout: 5s
```

- Errors now show line position

- New console command ":parse" - transform text into Mikrotik RouterOS command

- Non-existing commands now generates runtime error instead of parse-time error

Scripting (part 2)

```
[admin@RB_7] > :put ((1/0) . "...continue..")
division by zero
[admin@RB_7] > :put ([:surely [:put (1/0) ]] . "..continue.." )
division by zero..continue..
[admin@RB_7] >
```

- New console command ":surely" - allow to catch and freeze errors

```
[admin@RB_7] > :put (a=>1)
a=1
[admin@RB_7] > :put [:typeof (a=>1)]
pair
[admin@RB_7] > :put [:typeof ({a=>1;b=>2})]
array
[admin@RB_7] > :put [:typeof ({a=>1;b=>2}->b)]
str
[admin@RB_7] > :put ({a=>1;b=>2}->b)
2
```

- Updated console command ":typeof"

Scripting (part 3)

```
[admin@r4] > :put ([/in et pr as-value ])
.id=*1;comment=;name=ether1;mtu=1500;mac-address=52:54:00:64:03:00;arp=enabled;
.id=*2;comment=;name=ether2;mtu=1500;mac-address=52:54:00:64:03:01;arp=enabled;
.id=*3;comment=;name=ether3;mtu=1500;mac-address=52:54:00:64:03:02;arp=enabled
[admin@r4] > :put [:typeof ([/in et pr as-value ])]
array
[admin@r4] > :put ([/in et get ether1]->"mac-address")
52:54:00:64:03:00
```

- Arrays can be written as { item ; item ; item } inside expressions

- New "print" argument "as-value" - allow to return content of the menu as one array

- Each item now have unique, constant ID (.id) could be used instead of item numbers

NAT Traversal

- NAT Traversal (NAT-T) is a workaround allowing specific services to establish connections between hosts from private TCP/IP networks.

  - Introduced NAT-T for SIP

  - Introduced NAT-T for IPSec

  - Rewritten NAT-T for h323

  - Rewritten NAT-T for PPTP

Interface Bridge Settings

- There is new menu in RouterOS v3.0

  - /interface bridge settings

- There are two new options

  - use-ip-firewall (yes|no, default:no)- whether to pass internal bridge packet through the IP firewall (filters, mangle, nat) or not

  - use-ip-firewall-for-vlan (yes|no, default:no) – if "use-ip-firewall=yes" whether to pass bridge VLAN packet through the IP firewall (filters, mangle, nat) or not

Use-ip-firewall option

- By disabling internal bridge packet passage through the IP firewall you can increase bridge performance by:

  - Up to 40% with random size packets on the RouterBOARD 200 series
    (up to 65% with small and up to 20% with big packets)

  - Up to 65% with random size packets on the RouterBOARD 100 series
    (up to 80% with small and up to 45% with big packets)

  - Up to 80% with random size packets on the RouterBOARD 500 series
    (up to 100% with small and up to 65% with big packets)