Basic Configuration with MikroTik CLI

bdNOG11
Introduction to MikroTik CLI

MikroTik allows both GUI & CLI to manage MikroTik RouterOS. The CLI allows the Configuration of the Router's settings using Text Commands.

Pre Requisites:
- ✓ Familiar with MikroTik Menu

Methods:
- ✓ Telnet
- ✓ SSH
- ✓ Terminal
First time Startup with MikroTik CLI

- To get **CLI Console** of Router, You can use **telnet or, ssh**

- You can also get **CLI Platform** from **Terminal** of Router’s Menu
Quick Typing!

Use Tab Key for Quick Typing!

Example: /inte[Tab]_ becomes /interface _

If there is more than one match, but they all have a common beginning, like:

/\textit{interface set e}[\textup{Tab}]_ becomes /\textit{interface set ether}_

[admin@MikroTik] > interface set e[Tab]_
[admin@MikroTik] > interface set ether[Tab]_
[admin@MikroTik] > interface set ether[Tab]_

ether1  ether2  ether3  ether4  ether5

[?] – display all possible commands | help
Quick Typing! – Example

Another way to press fewer keys while typing:

[admin@MikroTik] > pin 10.1 c 100 si 1500

Equals to:

[admin@MikroTik] > ping 10.0.0.1 count 100 size 1500
The General Commands

print – shows all information from a particular level
add – add a new item
remove – removes specified item from a list
set – to change values of an item or parameter
find – associated with set, usually a conditional or matching statement | - action
enable – enable an item from list
disable – disable an item from list
comment – holds the description of an item
edit – modify values
move – changes the order of item from list
Basic Configuration

Basic Configuration are the Initial Arrangement or Minimum Configuration which we must do in every Router!

Basic Configuration includes:

✓ User Administration
✓ Hostname
✓ IP Addressing
✓ Default Route
✓ DNS Settings
✓ SNTP Settings
✓ Device Security
User Administration – Best Practice

✓ Set the “admin” Password after first Login
✓ Restrict “admin” Account
✓ Avoid too many Users with “full” Permission
✓ Customize Group Policy with minimum Permission
✓ Better not to use “admin” as operational User
User Administration

Set the “admin” Password:

Every Route has a Factory Preconfigured User “admin” with “empty/blank” Password. To set the Password for “admin” – Issue the Command from Terminal:

```
[admin@MikroTik] > user set admin password=******
```

Creating a New User and New Group Policy:

```
[admin@MikroTik] > user add name=pavel group=full password=******
[admin@MikroTik] > user group add name=monitor policy=read,telnet,winbox,local
[admin@MikroTik] > user add name=nmc group=monitor password=******
```

```
[admin@MikroTik] > user print
Flags: X - disabled

<table>
<thead>
<tr>
<th>#</th>
<th>NAME</th>
<th>GROUP</th>
<th>ADDRESS</th>
<th>LAST-LOGGED-IN</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>admin</td>
<td>full</td>
<td></td>
<td>Jan/05/2020 17:39:15</td>
</tr>
<tr>
<td>1</td>
<td>pavel</td>
<td>full</td>
<td></td>
<td>Jan/05/2020 17:14:32</td>
</tr>
<tr>
<td>2</td>
<td>nmc</td>
<td>monitor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

[admin@MikroTik] >
User Administration (Cont.)

Deactivating a User:  [admin@MikroTik] > user disable 2

Activating a User:  [admin@MikroTik] > user enable 2
User Administration (Cont.)

Restrict Access for Operational Users of MikroTik by IP Address:

Default Firewall protects your Router from unauthorized access from Outer Networks, it is also possible to restrict User access for the specific IP Address for more Security!

```
[admin@MikroTik] > user set 1 address=202.4.100.35,172.16.1.0/24,2405:7600:b:4::2
[admin@MikroTik] > user set pavel address=202.4.100.35,172.16.1.0/24,2405:7600:b:4::2
```

```
[admin@MikroTik] > user set 1 address=202.4.100.35,172.16.1.0/24,2405:7600:b:4::2
[admin@MikroTik] > user print
Flags: X - disabled

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<tr>
<td>0</td>
<td>admin</td>
<td>full</td>
<td>202.4.100.35/32</td>
<td>dec/03/2019 10:16:09</td>
</tr>
<tr>
<td>1</td>
<td>pavel</td>
<td>full</td>
<td>172.16.1.0/24</td>
<td>dec/02/2019 17:09:02</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2405:7600:b:4::...</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>nmc</td>
<td>monitor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```
User Administration (Cont.)

If you want to modify/remove IP Restriction for any Operational User of MikroTik, then we need to issue the below Command:

```
[admin@MikroTik]> /user edit pavel address
```

After issuing above Command, this screen will appear and you can modify from here!

You should able to login your Router via telnet or ssh
Hostname Configuration

Hostname of a device is its Identification. Hostname will say you in which Router or Switch you are currently working on.

Default Hostname of MikroTik is MikroTik.

Configuring Hostname of your Router:

[admin@MikroTik] > system identity set name=bdNOG11-IPv6
[admin@bdNOG11-IPv6] >
IP Addressing

Configuring IPv4 Address in an Interface:
[admin@bdNOG11-IPv6] > ip address add address=118.179.111.2/30 interface=ether1 comment=WAN

Configuring IPv6 Address in an Interface:
[admin@bdNOG11-IPv6] > ipv6 address add address=2405:7600:b::2/64 interface=ether1 comment=WAN
Default Route Configuration

Default Route for IPv4:
[admin@bdNOG11-IPv6] > ip route add dst-address=0.0.0.0/0 gateway=118.179.111.1

Default Route for IPv6:
[admin@bdNOG11-IPv6] > ipv6 route add dst-address=::/0 gateway=2405:7600:b::1
Creating “loopback” Interface

In MikroTik, there is no loopback Interface by default. We just create a bridge with Zero (0) member ports and it will always be active so that it will function as a regular loopback Interface.

```
/interface bridge add name=loopback0
/ip address add address=1.1.1.1/32 interface=loopback0 comment=RID
```
DNS Settings

**DNS** is a Client-Server Protocol where DNS Client requests for the Domain Name resolution and DNS Server response on it. The DNS Client is used to resolve Domain Name to IP Address from a DNS Server. On the other hand, the DNS Server feature provides Domain Name resolution for the Clients connected to it.

**MikroTik Router has both DNS Client and DNS Server features.**

```
/ip dns set servers=8.8.8.8,8.8.4.4,2001:4860:4860::8888,2001:4860:4860::8844
```

**Firewall to protect DNS Query from Outer Networks:**

```
/ip firewall filter add chain=input protocol=tcp dst-port=53 in-interface=ether1-WAN action=drop
/ip firewall filter add chain=input protocol=udp dst-port=53 in-interface=ether1-WAN action=drop
```

```
/ipv6 firewall filter add chain=input protocol=tcp dst-port=53 in-interface=ether1-WAN action=drop
/ipv6 firewall filter add chain=input protocol=udp dst-port=53 in-interface=ether1-WAN action=drop
```
Bandwidth Management Scripts

Day=Regular_Package
/queue type set [find name=Pkg1-DL] pcq-rate=10M
/queue type set [find name=Pkg1-UL] pcq-rate=10M
/queue type set [find name=Pkg2-DL] pcq-rate=20M
/queue type set [find name=Pkg2-UL] pcq-rate=20M

Night=Double_Bandwidth
/queue type set [find name=Pkg1-DL] pcq-rate=20M
/queue type set [find name=Pkg1-UL] pcq-rate=20M
/queue type set [find name=Pkg2-DL] pcq-rate=40M
/queue type set [find name=Pkg2-UL] pcq-rate=40M
SNTP Settings

Simple Network Time Protocol (SNTP) is a Networking Protocol for Clock Synchronization between Computer Systems. It is a simplified version of Network Time Protocol (NTP).

/system ntp client set enabled=yes primary-ntp=2001:4860:4860::8844 secondary-ntp=202.4.100.106
Creating Multiple VLANs in a Single Command:

```
[admin@bdNOG11-IPv6]> :for i from=101 to=199 do={interface vlan add name="vlan$i" vlan-id=$i interface=ether5}
```

Transferring VLANs from one Interface to Another:

```
[admin@bdNOG11-IPv6]> interface vlan set [find interface=ether5] interface=ether4
```
Have Fun with MikroTik CLI (Cont.)

Changing ARP Interface:
[admin@bdNOG11-IPv6] > ip arp set [find interface=ether4] interface=ether5

Shifting IP Address from one Interface to Another:
[admin@bdNOG11-IPv6] > ip address set [find interface=ether4] interface=ether5
Have Fun with MikroTik CLI (Cont.)

A Script to add multiple Queues in a Single Command:

```
[admin@bdNOG11-IPv6] > :for i from=2 to=254 do=/queue simple add name="PC-$i" target="172.16.1.$i" parent=Total-BW max-limit=10M/10M limit-at=5M/5M time=0s-1d,sun,mon,tue,wed,thu,fri,sat}
```
Backup Restoration

The Backup is option allows you to save a file containing all your Router’s Configuration Settings, like WAN Setup, Wireless Settings, Port Forwarding, Firewall etc. to a file on your Computer. This file can then be used to Restore your settings if the Router is Reset to the Factory Default Settings.

To take the Router Backup – execute the Command below:
[admin@bdNOG11-IPv6] > export file=bdNOG11-IPv6-MikroTik-BKP-11-01-2020

To Restore Backup into a Router – execute the Command below:
[admin@bdNOG11-IPv6] > import file=bdNOG11-IPv6-MikroTik-BKP-11-01-2020
Taking Backup for a Particular Module

You can also take Backup for a Particular Module like Queues, Filter Rules, NAT, PPPoE Secrets, IP Addresses or any other you want.

**Taking the Backup for Filter Rules:**

```
[admin@bdNOG11-IPv6]> ip firewall filter
[admin@bdNOG11-IPv6]/ip firewall filter> export file=bdNOG11-IPv6-Filter-Rules-11-01-2020
```

**Restoring the Backup for Filter Rules:**

```
[admin@bdNOG11-IPv6]> import file=bdNOG11-IPv6 -Filter-Rules-11-01-2020
```
The “export” Command

The “export” Command will help you to get the Router Backup and it will also help you find the correspond Command executed in a Particular Module like Firewall, Mangle, Queues, etc.

```bash
[admin@bdNOG11-IPv6] /ip firewall mangle> export
# Jan/06/2020 13:16:31 by RouterOS 6.46.1
# software id = VFLI-R9L8
# model = CCR1036-12G-4S
# serial number = 529A04E9FBB7
/ip firewall mangle
add action=mark-packet chain=prerouting new-packet-mark=Facebook passthrough=yes src-address-list=Facebook
add action=mark-packet chain=prerouting dst-address-list=Facebook new-packet-mark=Facebook passthrough=yes
add action=mark-packet chain=prerouting new-packet-mark=YouTube passthrough=yes src-address-list=YouTube
add action=mark-packet chain=prerouting dst-address-list=YouTube new-packet-mark=YouTube passthrough=yes
[admin@bdNOG11-IPv6] /ip firewall mangle> [ ]
```