



Hotspot Voucher Application

HOTSPOT
Basic features explained
and an app for
generating and printing
Hotspot vouchers

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DB Systems

MikroTik User Meeting
Athens (GR)
16 June 2015

Topics

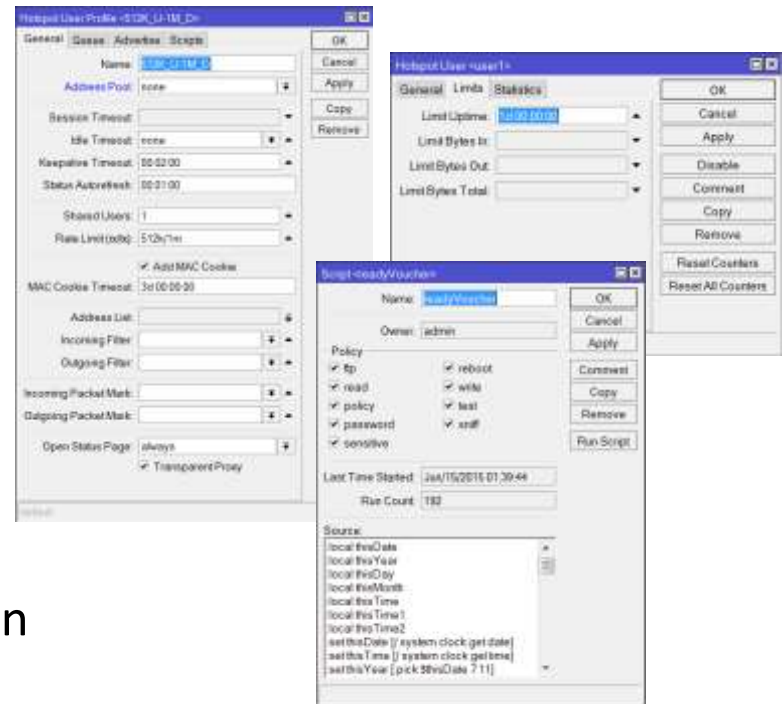
- **Hotspots and where are they used ?**
- **RouterOS Hotspot Package**
 - MikroTik RouterOS Hotspot Active Users per License Level
 - Hotspot setup example
- **RouterOS User Manager Package**
 - MikroTik RouterOS Active User Manager sessions per License Level
 - Hotspot with User Manager setup example
- **External Cloud based or Local PC as Radius Server**
 - Hotspot with RADIUSdesk VM setup example
- **DB Systems Hotspot Voucher application for User Manager and regular Hotspot**
 - Voucher generator example

Hotspots and where are they used?

- Hotspot is a RouterOS package which restricts internet access through wired or wireless networks
- It function as regular Hotspot, as User manager embedded Radius server or with external alternatives
- There are mainly used in hotels, bars, clubs, shopping malls, campings, municipal hotspots and wherever you want

RouterOS Hotspot

- The MikroTik Hotspot Gateway provides authentication for clients before access to public networks
- Very easy to setup
- It offers bandwidth rate limits
- It uses uptime limit to expire users
- Regular Hotspot is not able to control user deletion automatically
- Regular hotspot user deletion is controlled using a script
- DB Systems Hotspot voucher application transfers the script to the router



Safe Mode

Quick Set
Interfaces
Wireless
Bridge
PPP
Switch
Mesh
IP
MPLS
Routing
System
Queues
Files
Log
Radius
Tools
New Terminal
MetaROUTER
Partition
Make Supout.rif
Manual
Exit

ARP
Accounting
Addresses
Cloud
DHCP Client
DHCP Relay
DHCP Server
DNS
Firewall
Hotspot
IPsec
Neighbors
Packing
Pool
Routes
SMB
SNMP
Services
Settings
Socks
TFTP
Traffic Flow
UPnP
Web Proxy

Hotspot

Servers Server Profiles Users User Profiles **Active** Hosts IP Bindings ...

+ - ✓ ✕ T Reset HTML **Hotspot Setup** Find

| Name | Interface | Address P... | Profile | Address... |
|------|-----------|--------------|---------|------------|
|------|-----------|--------------|---------|------------|

Hotspot Setup

Select interface to run HotSpot on 4

HotSpot Interface: bridge_hs

Back Next 5 Cancel

Hotspot Setup

Set HotSpot address for interface

Local Address of Network: 10.5.50.1/24

☒ Masquerade Network

Back Next 6 Cancel

Hotspot Setup

Set pool for HotSpot addresses

Address Pool of Network: 10.5.50.2-10.5.50.254

Back Next 7 Cancel

Hotspot Setup

Select hotspot SSL certificate

Select Certificate: none

Back Next 8 Cancel

Hotspot Setup

Select SMTP server

IP Address of SMTP Server: 0.0.0.0

Back Next 9 Cancel

Hotspot Setup

Setup DNS configuration

DNS Servers: 8.8.8.8
8.8.4.4

Back Next 10 Cancel

Hotspot Setup

DNS name of local hotspot server

DNS Name:

Back Next 11 Cancel

Hotspot Setup

Create local HotSpot user

Name of Local HotSpot User: admin

Password for the User: 1234

Back Next 12 Cancel

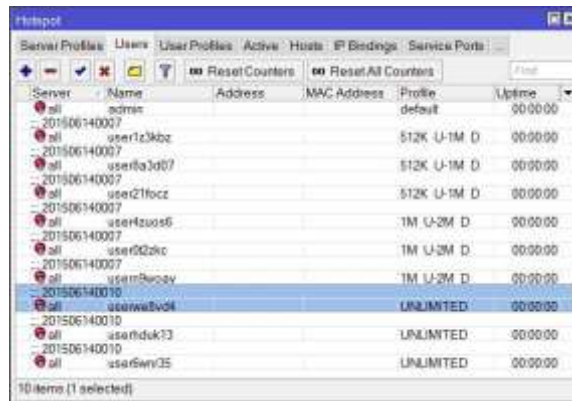
Hotspot Setup

Setup has completed successfully 13

OK

MikroTik RouterOS Hotspot Active Users per License Level

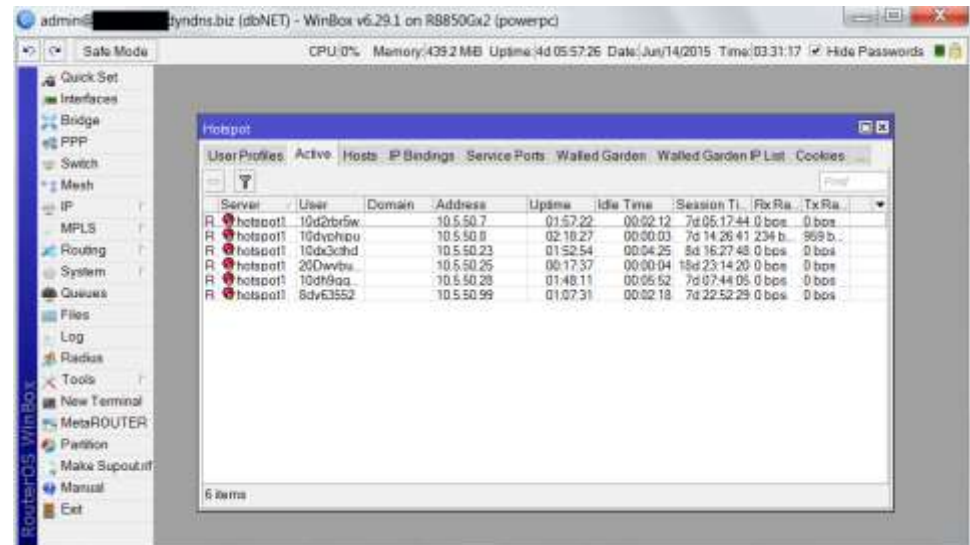
Regular Hotspot allows 1 active user on L3 License, 200 active users on L4 License , 500 users on L5 License and Unlimited users for L6 License.



The screenshot shows the 'User Profiles' tab in the WinBox Hotspot configuration window. It displays a list of user profiles with columns for Name, Address, MAC Address, Profile, and Uptime. The profiles are sorted by Name. The last three profiles are highlighted in blue, indicating they are selected.

| Server | Name | Address | MAC Address | Profile | Uptime |
|--------------|------------|---------|-------------|-------------|----------|
| all | admin | | | default | 00:00:00 |
| 201506140007 | user1z3kbc | | | 512K U-1M D | 00:00:00 |
| 201506140007 | user1a3d07 | | | 512K U-1M D | 00:00:00 |
| 201506140007 | user21foc | | | 512K U-1M D | 00:00:00 |
| 201506140007 | user4zuos5 | | | 1M U-2M D | 00:00:00 |
| 201506140007 | user92zkc | | | 1M U-2M D | 00:00:00 |
| 201506140007 | user1Rucay | | | 1M U-2M D | 00:00:00 |
| 201506140010 | userw8v04 | | | UNLIMITED | 00:00:00 |
| 201506140010 | userfduk13 | | | UNLIMITED | 00:00:00 |
| 201506140010 | user5wv05 | | | UNLIMITED | 00:00:00 |

10 items (1 selected)



The screenshot shows the 'Active' tab in the WinBox Hotspot configuration window. It displays a list of active users with columns for Server, User, Domain, Address, Uptime, Idle Time, Session T1, Fix Ra, and Tx Ra. The list shows several active users with their respective session details.

| Server | User | Domain | Address | Uptime | Idle Time | Session T1 | Fix Ra | Tx Ra |
|------------|-----------|--------|------------|----------|-----------|--------------|--------|-------|
| R hotspot1 | 10d2br5w | | 10.5.50.7 | 01:57:22 | 00:02:12 | 7d 05:17:44 | 0 bps | 0 bps |
| R hotspot1 | 10dychpu | | 10.5.50.8 | 02:18:27 | 00:00:03 | 7d 14:26:41 | 234 b | 869 b |
| R hotspot1 | 10dx3cthd | | 10.5.50.23 | 01:52:54 | 00:04:25 | 8d 16:27:48 | 0 bps | 0 bps |
| R hotspot1 | 20Dwbu | | 10.5.50.25 | 00:17:37 | 00:00:04 | 18d 23:14:20 | 0 bps | 0 bps |
| R hotspot1 | 10dH9ag | | 10.5.50.28 | 01:48:11 | 00:05:52 | 7d 07:44:05 | 0 bps | 0 bps |
| R hotspot1 | 8dyE3552 | | 10.5.50.99 | 01:07:31 | 00:02:18 | 7d 22:52:29 | 0 bps | 0 bps |

6 items



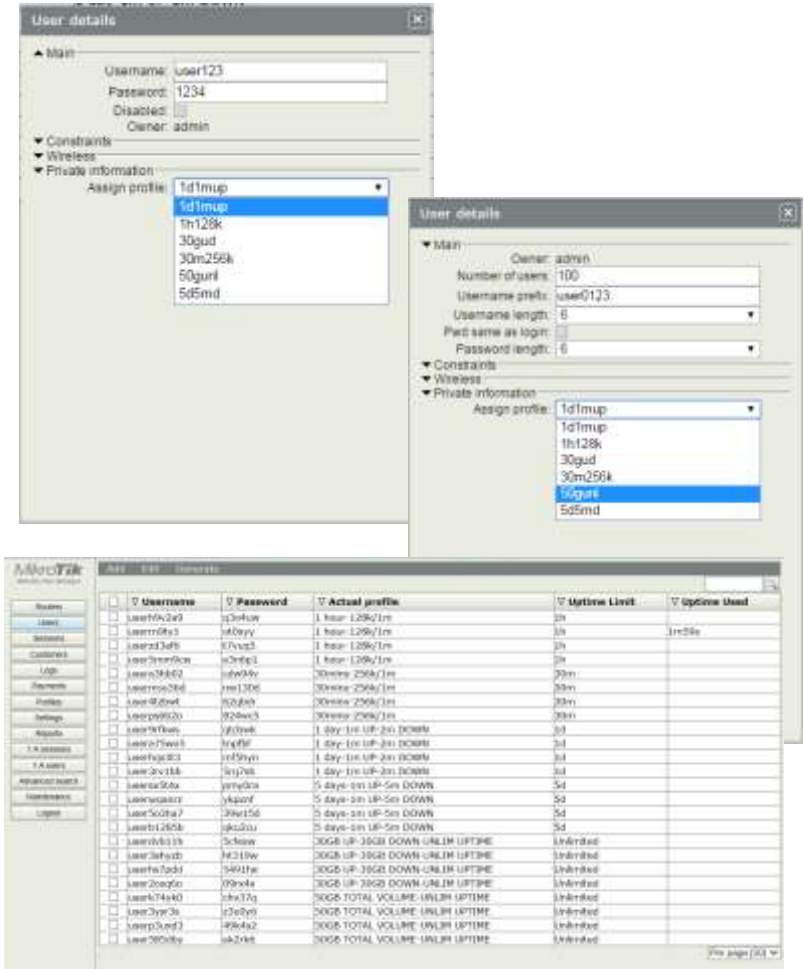
| Feature | Level | 0 (Free) | 3 (WISP CPE) | 4 (WISP) | 5 (WISP) | 6 (Controller) |
|--------------------------------|--|---|--|-------------|--|-------------------|
| Upgradable to | | - / - | actual Release + 1 (actual up to ROS 7.x) | | actual Release + 2 (actual up to ROS 8.x) | |
| Configuration support | | Our customers get full support from us! | | | | |
| Wireless AP | The demo version is fully featured, only restricted to an operating time of 24 hours! | - / - | ✓ | ✓ | ✓ | ✓ |
| Wireless Client / Bridge (PtP) | | ✓ | ✓ | ✓ | ✓ | ✓ |
| RIP, OSPF, BGP | | ✓ (*) | ✓ | ✓ | ✓ | ✓ |
| EoIP tunnels | | unlimited | unlimited | unlimited | unlimited | unlimited |
| PPPoE tunnels | | 200 | 200 | 500 | unlimited | unlimited |
| PPTP tunnels | | 200 | 200 | 500 | unlimited | unlimited |
| L2TP tunnels | | 200 | 200 | 500 | unlimited | unlimited |
| OVPN tunnels | | 200 | 200 | unlimited | unlimited | unlimited |
| VLAN interfaces | | unlimited | unlimited | unlimited | unlimited | unlimited |
| active HotSpot user | | 1 | 200 | 500 | unlimitiert | |
| RADIUS client | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Queues | | unlimited | unlimited | unlimited | unlimited | unlimited |
| Web proxy | | ✓ | ✓ | ✓ | ✓ | ✓ |
| active User Manager sessions | 10 | 20 | 50 | unlimited | | |
| Number of KVM guests | unlimited | unlimited | unlimited | unlimited | unlimited | |

(*) BGP only included in licenses for RouterBOARDS, not in licenses for x86 hardware!

All information is based on the current version, this is actual RouterOS Release 6.x

RouterOS User Manager

- User manager package is an embedded radius server, that creates users based on pre-configured profiles
- User manager can control several hotspots on different routers, using a single user database
- User manager is resource intensive (RAM, CPU and disk)
- User manager logs and created users are not automatically deleted. You must perform database maintenance to free disk space



RouterOS User Manager

- User manager allows session details and log details
- User manager tends to leave open some user sessions when user is disconnected. This makes the system to run out of available active sessions depending on your license
- User manager active sessions are highly limited except L6 License

MicroTik WinBox WinBox User Manager

Tools

Router Users Database Customers Logs Payments Profiles Settings Reports

3.3 versions 3.3 users Admin as user? Maintenance Logout

1/1

| <input type="checkbox"/> | ▼ Username | ▼ Status | ▼ User IP | ▼ From time | ▼ Till time | ▼ Uptime | ▼ Download | ▼ Upload | ▼ Calling station ID |
|--------------------------|------------|--------------------------|------------|---------------------|---------------------|----------|------------|----------|----------------------|
| <input type="checkbox"/> | userm10y1 | Start & Stop & [1059:10] | 10.0.0.253 | 06/14/2015 03:17:58 | 06/14/2015 03:40:43 | 23m25s | 710.9 KiB | 99.1 KiB | D0-22-8E-47-C6-38 |

Per page [20] ▼

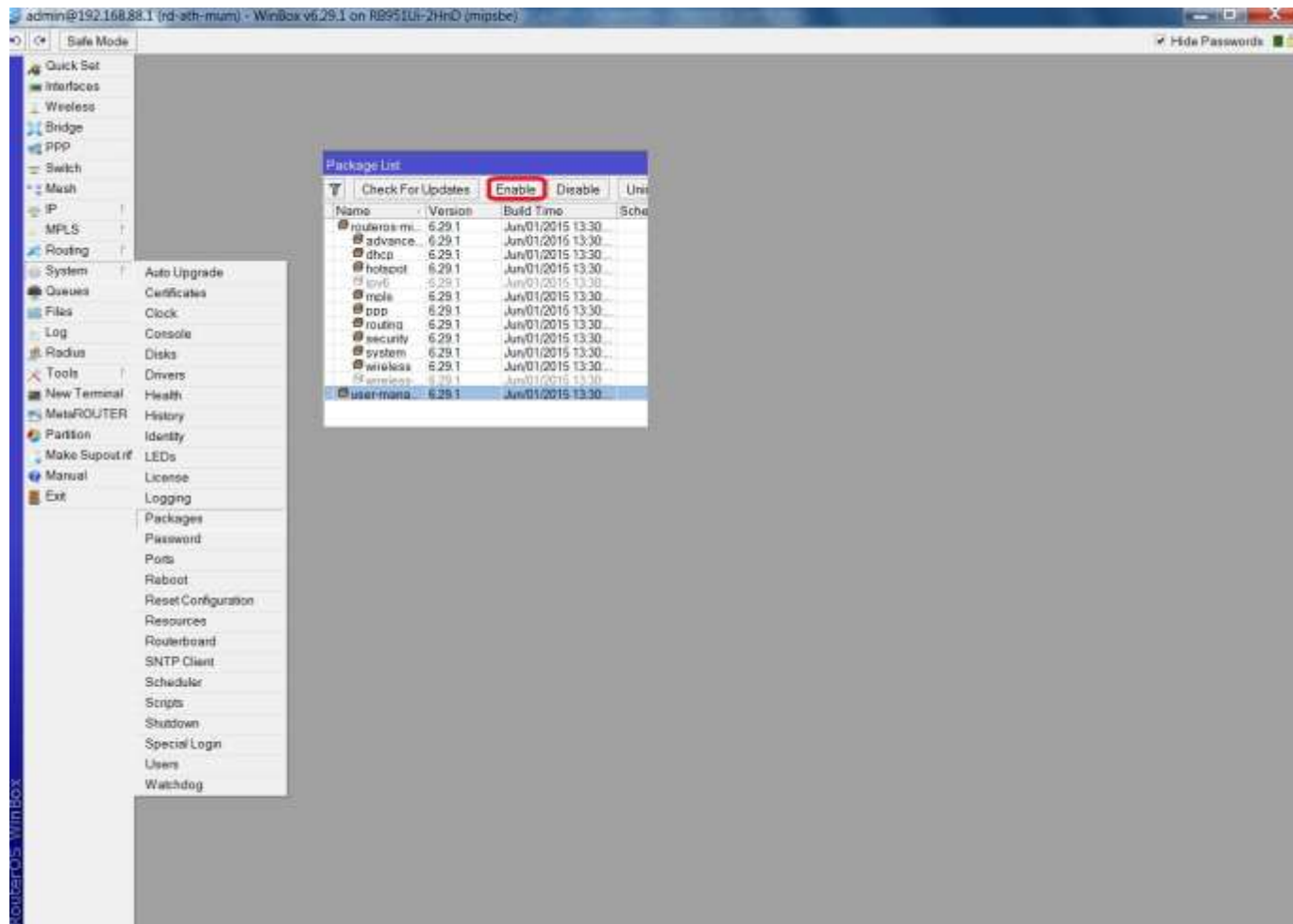
```
Session details
Username: user@5yrl
NAS port: 21.048.222.18
Status: state: stop & Inform
User IP: 10.0.0.253
Source IP: 127.0.0.1
NAS port ID: bridge_1x
Port name: D01A2015 02:17:18
Tid name: D01A2015 03:40:43
Uptime: 230679s
Down oad: 712.9 KiB
Up oad: 59.1 KiB
Calling number ID: 0022 EE 47 0838
```



Log details

Username: stera
 User IP: 10.0.0.254
 Host IP: 127.0.0.1
 Status: Authentication failure
 Time: 06/13/2016 22:02:18
 Description: user 'stera' not found for user 'stera'
 NAS port: 2146532256
 NAS port ID: bridge_16
 ACCT Session ID:
 Calling station ID: 00:C0:A0:E1:01:7B

Download extra packages from MikroTik, transfer to the router and then enable it



Access it through its web interface x.x.x.x/userman

A screenshot of the MikroTik User Manager login page. The page has a light beige background with a dark grey header bar. The MikroTik logo and 'Mikrotik User Manager' text are centered at the top. Below this, there are two input fields: 'Login' and 'Password'. A 'Log in' button is centered below the password field.

MikroTik RouterOS Active User Manager sessions per License Level

For example L3 License can only perform 10 active sessions , L4 License 20 active sessions , L5 50 active sessions , ON L6 License you have unlimited active sessions .



The image shows a web-based login interface for MikroTik User Manager. It features a light green background with a dark gray header bar. The MikroTik logo is centered at the top, with the text "MikroTik" in a stylized font and "Mikrotik User Manager" in a smaller font below it. Below the logo, there are two input fields: one labeled "Login" and another labeled "Password". Both fields are white with a thin blue border. Below the password field is a "Log in" button with a gray gradient and a thin black border.



| Feature | Level | 0 (Free) | 3 (WISP CPE) | 4 (WISP) | 5 (WISP) | 6 (Controller) |
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| OVPN tunnels | | 200 | 200 | unlimited | unlimited | unlimited |
| VLAN interfaces | | unlimited | unlimited | unlimited | unlimited | unlimited |
| active HotSpot user | | 1 | 200 | 500 | unlimited | unlimited |
| RADIUS client | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Queues | unlimited | unlimited | unlimited | unlimited | unlimited | |
| Web proxy | ✓ | ✓ | ✓ | ✓ | ✓ | |
| active User Manager sessions | | 10 | 20 | 50 | unlimited | unlimited |
| Number of KVM guests | | unlimited | unlimited | unlimited | unlimited | unlimited |

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External Cloud based or Local PC as Radius Server

- It can be installed on Virtual Machine local or cloud based, the fast and easy way
- On cloud VPS, it needs its time and not so easy for inexperienced users, to install from source you need sufficient knowledge and experience on Linux to:
 - Install the Linux operating system
 - Edit text files from the terminal using a text editor like **Vi** or **Nano**
 - Install packages from a repository
 - Install a database like Mysql or alternatives
 - Probably easy for web developers
- But it takes full advantage of RouterOS as it uses Active Hotspot users feature, compared to User manager active sessions which are highly limited per level, except L6 license which is unlimited
- User manager Radius and Hotspot are free packages within RouterOS, which can save you a lot of money compared to the use of external alternatives, cloud based or local PC Radius servers, as an example :
 - DMA Radius Manager (paid)
 - FreeRADIUS (free)
 - RADIUSDesk (free)
- If you are planning to deploy a low cost hotspot setup for a very small to small sized businesses this is an expensive solution.

Hotspot with RADIUSdesk VM setup example on local PC

- Prepare RouterBOARD
- Reset RouterBOARD default configuration
- Gain access to internet, by default ether1 it has dhcp-client enabled for gaining access from a broadband router, in my example I am using LTE interface as broadband access
- Set the Mikrotik's identity according to RADIUSdesk's **NAS-Identifier** to **uniquely identify** the Mikrotik router
- In my case I created two bridges one for local access and one for hotspot
 - Bridge-local which uses physically wlan interface for local access and for providing RADIUSdesk access to the router
 - Bridge-hs with a virtual ap for Hotspot, which uses radius authentication
- Confirm that you're getting access from dhcp-client
- Add radius server
 - Select hotspot service
 - Specify the ip address which will be used by RADIUSdesk
 - Specify shared secret which will be used by RADIUSdesk
- Setup Hotspot
 - Modify the created Server Profile to use radius
 - Change interim-update to 10 minutes, to update from NAS to RADIUS the status of active sessions

Safe Mode

Hide Passwords

- Quick Set
- Interfaces
- Wireless
- Bridge
- PPP
- Switch
- Mesh
- IP
- MPLS
- Routing
- System
- Queues
- Files
- Log
- Radius
- Tools
- New Terminal
- MetaROUTER
- Partition
- Make Supout.rif
- Manual
- Exit

Interface List

| Interface | Ethernet | EoIP Tunnel | IP Tunnel | GRE Tunnel | VLAN | VRRP | Bonding | LTE |
|----------------|----------|-------------|-----------|------------|------|------|---------|-----|
| bridge-hs | | | | | | | | |
| bridge-local | | | | | | | | |
| ether1 | | | | | | | | |
| ether2-mast... | | | | | | | | |
| ether3-slav... | | | | | | | | |
| ether4-slav... | | | | | | | | |
| ether5-slav... | | | | | | | | |
| lte1 | | | | | | | | |
| wlan-local | | | | | | | | |
| wlan-hs | | | | | | | | |

10 items

DHCP Client

| Interface | Use ... | Add ... | IP Address | Expires After | Status |
|---------------------------|---------|---------|----------------|---------------|--------|
| ... default configuration | | | | | |
| lte1 | yes | yes | 192.168.9.1... | 22:05:07 | bound |

1 item

Firewall

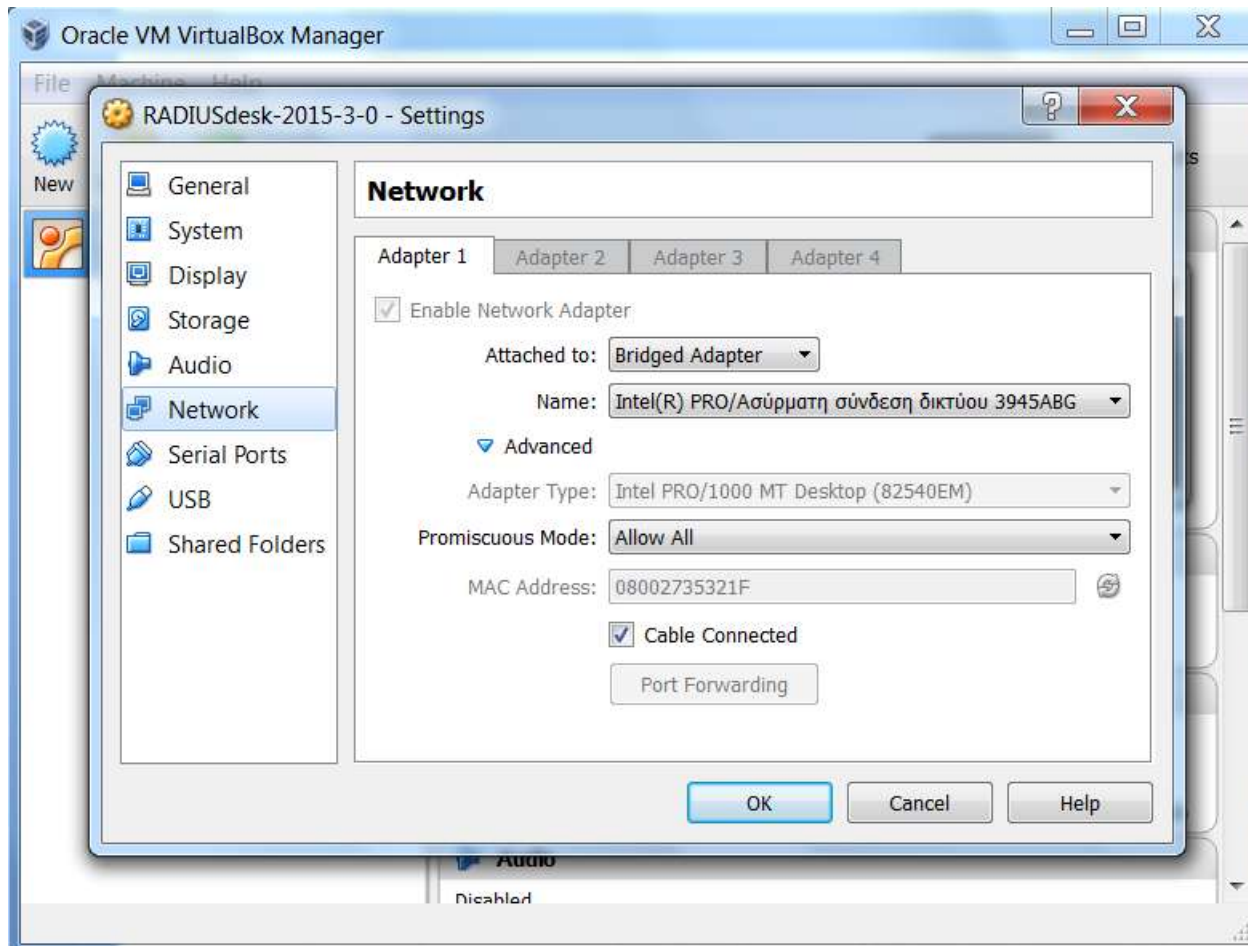
| Filter Rules | NAT | Mangle | Service Ports | Connections | Address Lists | Layer7 Protocols | | | | | |
|------------------------------|--------|--------------------|----------------|--------------------|---------------|------------------|------------|-------------|------------|------------|---------|
| | | | | | | | | | | | |
| | | | Reset Counters | Reset All Counters | Find | all | | | | | |
| # | Action | Chain | Src. Addr... | Dst. Addr... | Prot... | Src. Port | Dst. Port | In. Inte... | Out. In... | Bytes | Packets |
| 0 D | | jump forward | | | | | | | | 83.4 KiB | 458 |
| 1 D | | jump forward | | | | | | | | 0 B | 0 |
| 2 D | | jump input | | | | | | | | 177.4 KiB | 1 847 |
| 3 D | | drop input | | | 6 (tc... | | 64872-6... | | | 0 B | 0 |
| 4 D | | jump hs-input | | | | | | | | 177.4 KiB | 1 847 |
| 5 D | | ac... hs-input | | | 17 (...) | | 64872 | | | 19.4 KiB | 309 |
| 6 D | | ac... hs-input | | | 6 (tc... | | 64872-6... | | | 152.2 KiB | 1 472 |
| 7 D | | jump hs-input | | | | | | | | 5.6 KiB | 63 |
| 8 D | | rei... hs-unauth | | | 6 (tc... | | | | | 24.8 KiB | 426 |
| 9 D | | rei... hs-unauth | | | | | | | | 64.2 KiB | 95 |
| 10 D | | rei... hs-unaut... | | | | | | | | 0 B | 0 |
| ... place hotspot rules here | | | | | | | | | | | |
| 11 X | | pa... unused... | | | | | | | | 0 B | 0 |
| ... default configuration | | | | | | | | | | | |
| 12 | | ac... input | | | 1 (ic... | | | | | 5.1 KiB | 50 |
| ... default configuration | | | | | | | | | | | |
| 13 | | ac... input | | | | | | | | 3229.1 ... | 48 219 |
| ... default configuration | | | | | | | | | | | |
| 14 | | drop input | | | | | | lte1 | | 16.1 KiB | 133 |
| ... default configuration | | | | | | | | | | | |
| 15 | | fas... forward | | | | | | | | 16.0 MiB | 77 923 |
| ... default configuration | | | | | | | | | | | |
| 16 | | ac... forward | | | | | | | | 16.0 MiB | 77 923 |
| ... default configuration | | | | | | | | | | | |
| 17 | | drop forward | | | | | | | | 2108 B | 41 |
| ... default configuration | | | | | | | | | | | |
| 18 | | drop forward | | | | | | lte1 | | 0 B | 0 |
| 19 | | drop forward | | 192.168.9.1 | | | | brida... | | 3120 B | 52 |

20 items (1 selected)

Hotspot with RADIUSdesk

VM setup example on local PC

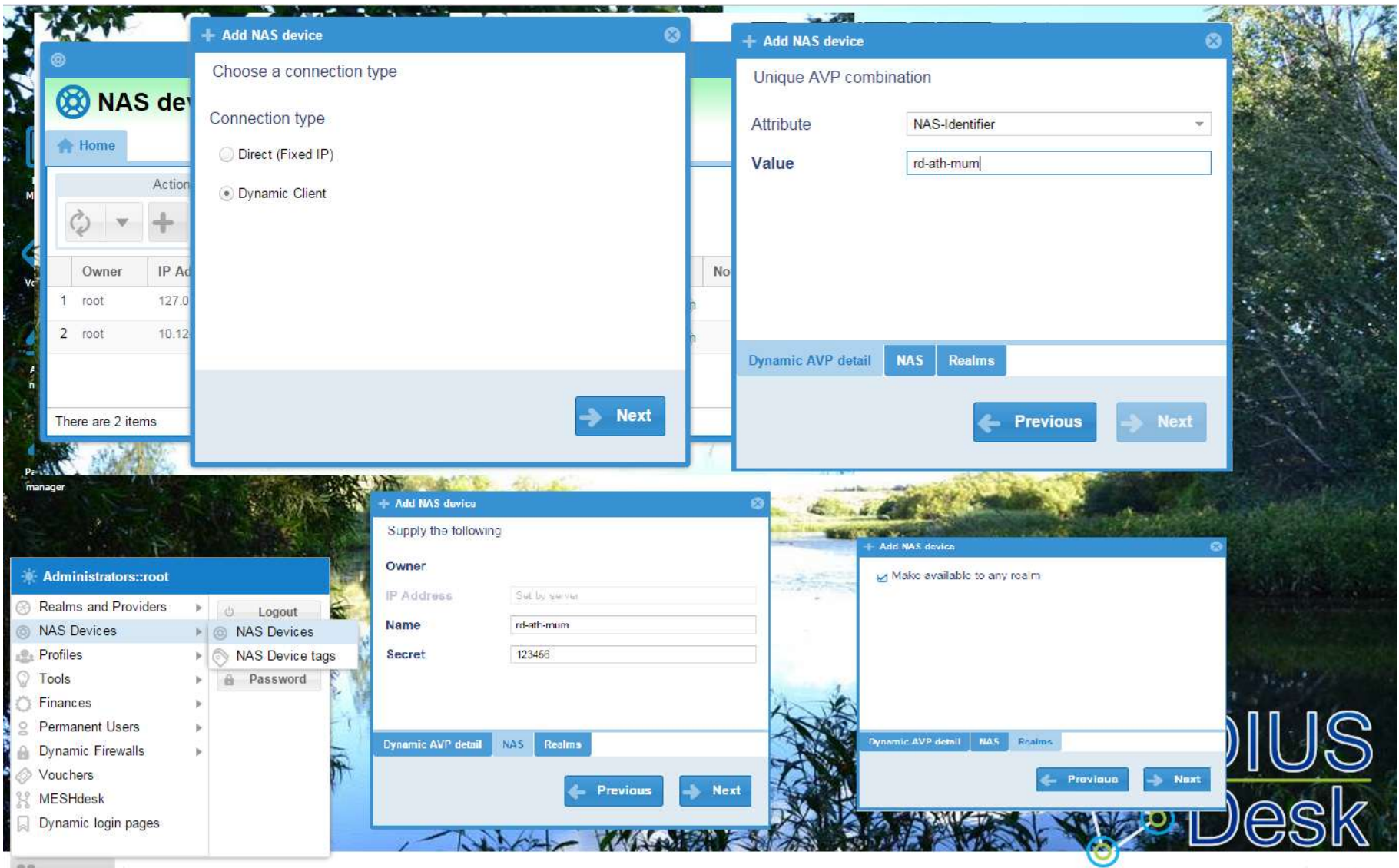
- Install VirtualBox
- Download the latest OVA file from RADIUSdesk's project on SourceForge
- Launch the VirtualBox application.
- Select **File → Import Appliance**. This will open a wizard that will ask you to select a OVA file to import.
- After it is imported you should fine-tune the appliance according to your needs. The most important part is the network interfaces




Hotspot with RADIUSdesk

VM setup example on local PC

- Let's assume you have already installed VirtualBox and the appliance
- Access RADIUSdesk through its ip address x.x.x.x/rd/
- Prepare RADIUSdesk
- Log into the RADIUSdesk webtop as the root user with password admin
- We will add a NAS device of Connection type → Dynamic client
- The value of NAS-Identifier (on the Mikrotik → System → Identification) has to be set when adding a new NAS device. This value has to be set in three places :
 - 1) Dynamic AVP detail sub-tab in the add wizard will specify
 - 2) NAS sub-tab in the add wizard
 - 3) Edit NAS → Optional info sub tab
- Select Menu → NAS Devices → NAS Devices
 - An optional screen will ask to specify the owner, if you are root check logged in user and press next
 - Press add → select Dynamic client → next → Dynamic AVP detail Attribute → NAS Identifier → value = MikroTik identity → sub-tab NAS → name = MikroTik identity → Secret=shared secret specified in MikroTik radius → Realms → check make available to any realm → next
 - Once the NAS device has been created, edit it through NAS → Optional info sub tab
 - Specify the NAS-Identifier as per MikroTik identity.
 - Also select the type as Mikrotik-heartbeat and save the changes.
- Restart RADIUSdesk VM in order to activate the changes.
- Alternatively (only as root user) go to Menu → Tools → Logfile Viewer and Stop, Start in the Logfile viewer toolbar
 - **After completion and ip address assignement from hotspot server, on the captive portal you can use predetermined user : dvdwalt with password dvdwalt to test your results.**



 **NAS devices**

Home

10.120.0.5

Dynamic AVP detail

NAS

Realms

Photo

Availability

Heartbeat actions

Usage graphs

NAS-Identifier

rd-ath-mum

Type

Mikrotik-Heartbeat

Ports

Community

Server

Description

RADIUS Client

< Required info

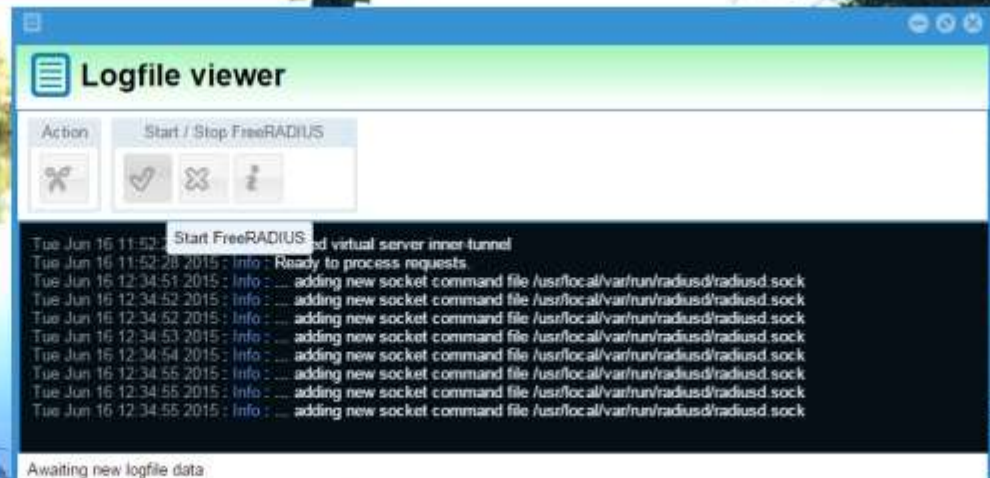
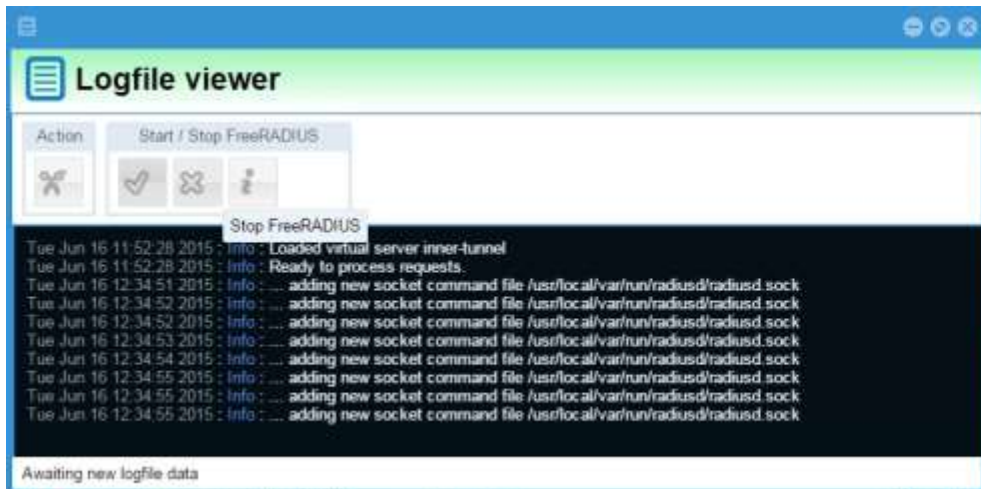
Optional info

Monitor settings

Maps info

>

✓ Save



DB Systems Hotspot Voucher application for User Manager and regular Hotspot

- It connects to RouterOS through API protocol
- Both User Manager and regular Hotspot supported
- Automatic detection of User Manager profiles and customers
- Customizable user prefix, price currency and generated user and password length.
- User name creation is verified, no user will be duplicated
- It creates user profiles for regular Hotspot
- For regular Hotspot users deletion it transfers a script to ROS
- Fully customizable voucher designs
- Compatible with RouterOS version 4.x through 6.x

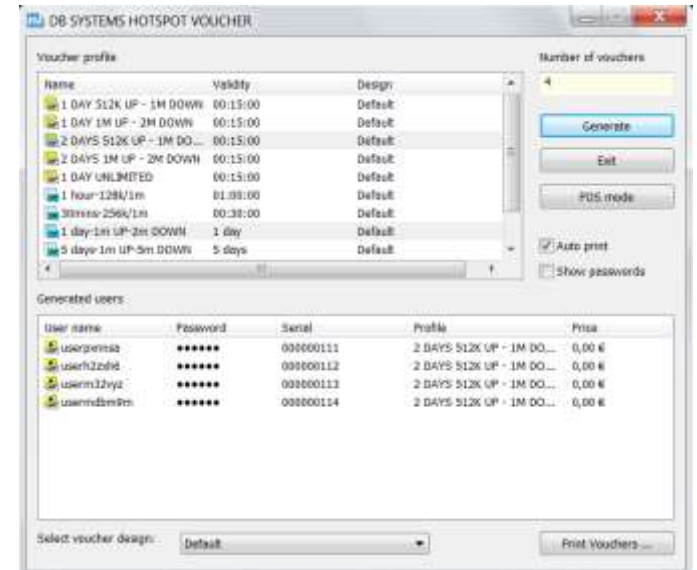


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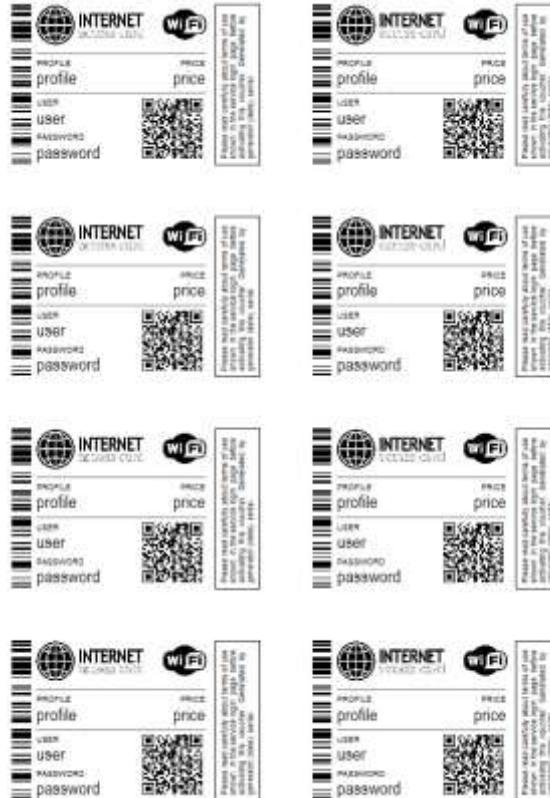
- POS mode



- Normal mode



Generating and printing vouchers



Thanks for your attention



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Halkidiki, Greece