



# RADIUS – CUSTOMER MANAGEMENT POLAND 2010

HOW-TO, EXPERIENCE AND  
RESOURCES  
BY MARTIN KRUG

## ■ Presentation

Mine presentation should show the answer on the question WHY? We need RADIUS.

And show mine experience with different software solutions.

It maybe will help the ISP's to understood how easy it can be done = small HOW-TO

## Technology – ISP evolution

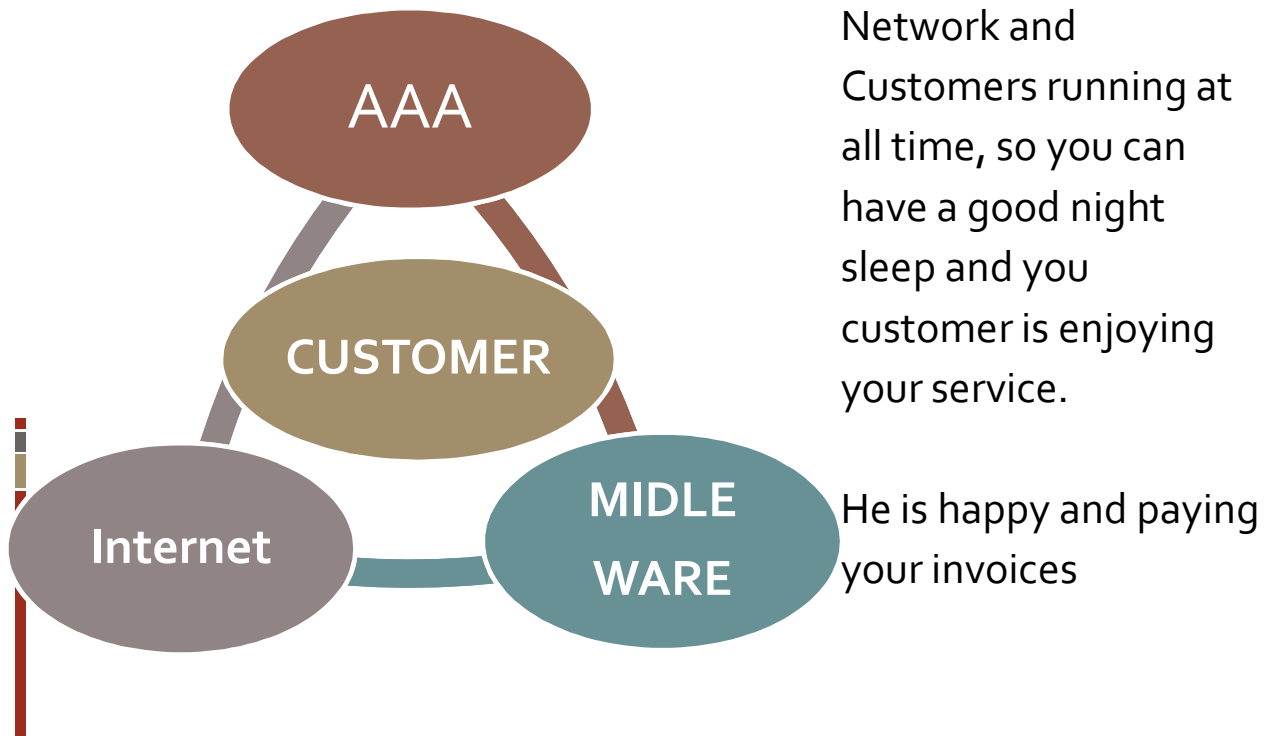
How is the ISP evolving ?

1. Usually they start's with "BLACK BOX" = cheap, easy to configure = LOOOOT's of trouble
2. Then he tries some Linux because someone told hem that he need's shaping, So he ask his friend from school to create a Linux Shaper. This will end in 1 year because to maintain is toooooo expensive.

## Technology evolves

3. Then he tries Cisco because a BIG provider's are using it.
4. Last, he will got rid of the "user friendly" devices and finally will get a MikroTik router, and If someone will give him a good information he will not use a RB133 as a Main gateway shaper.

## EVOLUTION NEEDS



## EVOLUTION of the CUSTOMER

“Customer will tolerate a 3hours without electricity, 1day without hot water, 1week without a heating !

BUT will not tolerate 5minutes INTERNET outage”

## ||| MAIN MENU

I would like to subscribe various systems that you need to maintain a network in ISP environment

And I will show how to maintain your customers.

MikroTik Services

UserManager

FreeRadius

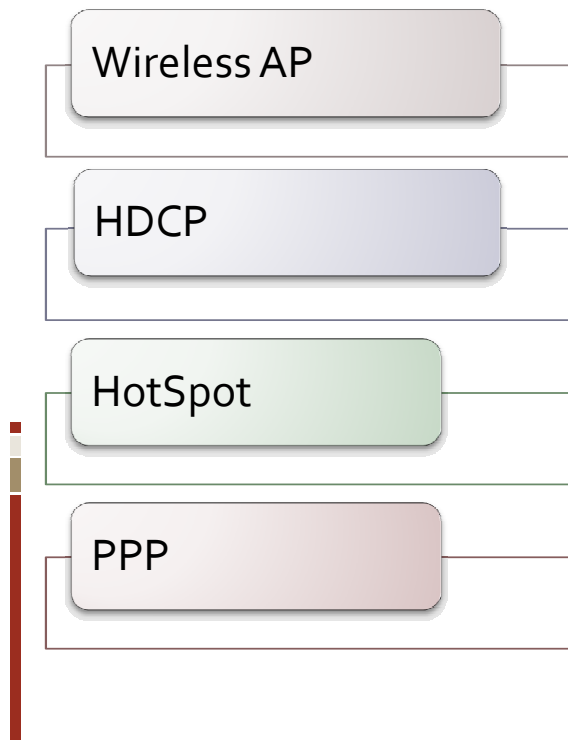
Resources

## ||| MikroTik Services

All of that CUSTOMER services can be managed by the hand clicking DISABLE if he will.

But WHY if there is a easy way.

## ||| MikroTik Services



Some of the possible engines to allow customer to get him service.

To assure higher security for you and your customers

## ||| RADIUS CLIENT

MikroTik implementation of a Radius Client is universal to even for different services but there can be created connections to different Radius Servers. MikroTik UserManager, Linux FreeRadius and Microsoft.

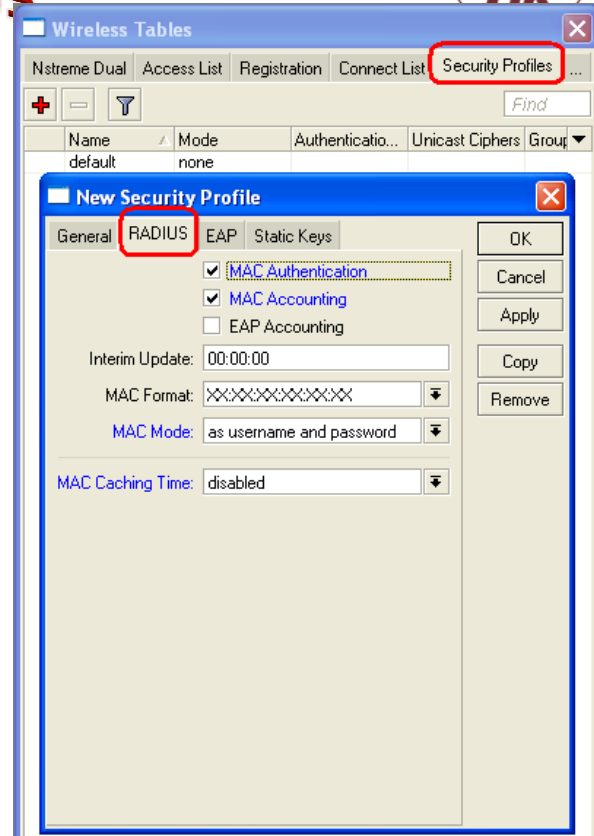
It will work with all RFC compliant servers.

# Wireless AP - radius

As you can see it is really easy to use a Radius functionality in MikroTik .

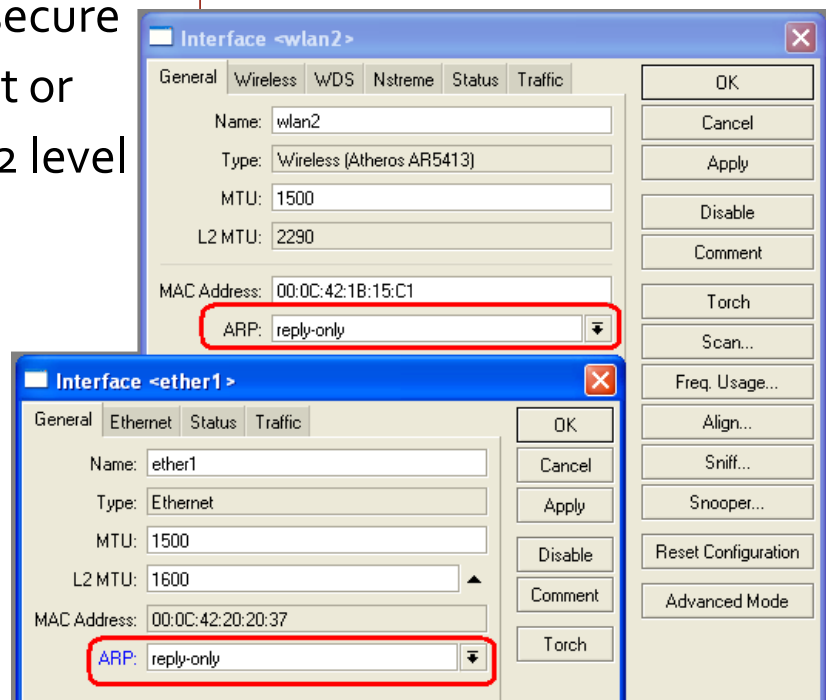
Important is the what we will reach with this function.

To secure access is the first step to make secure connection directly on the Wireless interface or Ethernet interface.



# Interface Security

The next step to secure access to Ethernet or Wireless on the L2 level is to set up a ARP: reply-only



## || DHCP – Radius support

You customer need a IP = solution

1. DHCP Server on that interface – with enabled RADIUS
2. And ADD Arp for leases.



## || PPP - services



Better solution

Bridged network

- PPPoE

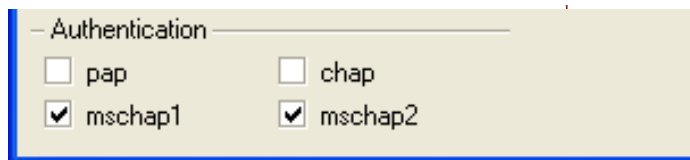
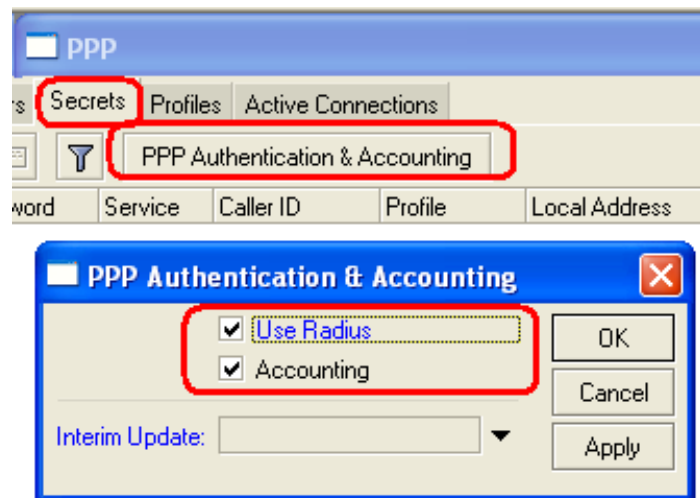
Routed network

- PPTP
- L2TP

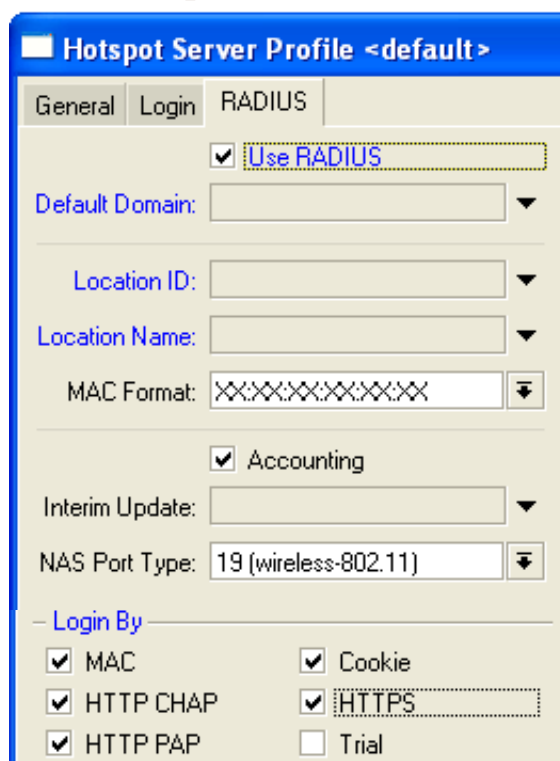


# PPP and Radius

As you can see it is easy to enable a Radius support for the PPP service.



# HotSpot



Possible AUTH.

- NAME / PWD
- MAC

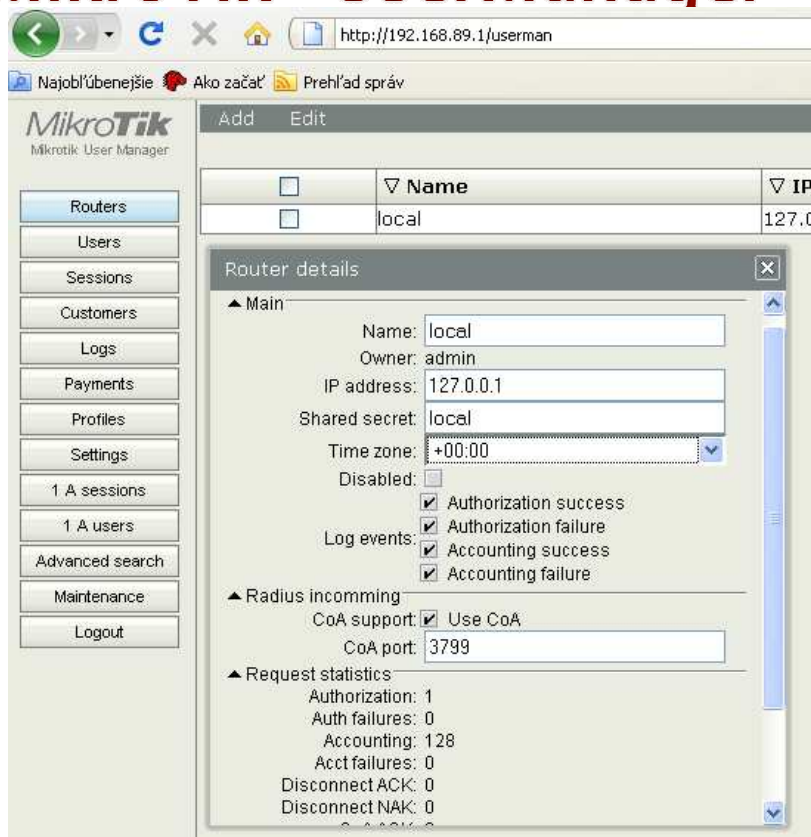
# MikroTik - UserManager

Build In Radius with functionality for a  
other MikroTik router's

Usable Beta version with a new functionalities

- working hierarchy
- user can bind MAC address to IP
- administrator – separation
- own look – to adjust
- database backup

# MikroTik - UserManager



The screenshot displays the MikroTik UserManager web interface. The browser address bar shows the URL <http://192.168.89.1/userman>. The interface includes a navigation menu on the left with options like Routers, Users, Sessions, Customers, Logs, Payments, Profiles, Settings, 1 A sessions, 1 A users, Advanced search, Maintenance, and Logout. The main content area shows a table with columns for Name and IP, listing a router named 'local' with IP '127.0.0.1'. A 'Router details' dialog box is open, showing configuration for the 'local' router. The 'Main' section includes fields for Name (local), Owner (admin), IP address (127.0.0.1), Shared secret (local), and Time zone (+00:00). There are checkboxes for 'Disabled' and 'Log events' (Authorization success, Authorization failure, Accounting success, Accounting failure). The 'Radius incoming' section has 'CoA support' checked and 'CoA port' set to 3799. The 'Request statistics' section shows: Authorization: 1, Auth failures: 0, Accounting: 128, Acct failures: 0, Disconnect ACK: 0, and Disconnect NAK: 0.

# MikroTik - UserManager

MikroTik Mikrotik User Manager

Add Edit

<input type="checkbox"/>	▼ Login	▼ Paren
<input type="checkbox"/>	admin	admin

Customer details

▲ Main

Login: admin  
 Password:   
 Disabled:   
 Parent: admin  
 Permissions: Owner  
 Public ID:   
 Public host:   
 Backup allowed:

▲ Access

Own routers  
 Parents routers  
 Own users  
 Parents users  
 Own profiles  
 Parents profiles  
 Own limitations  
 Parents limitations  
 Configure payment gateways  
 Use parent payment gateways

▼ Private information  
 ▼ Signup options  
 ▼ Format

Currency:   
 Time zone: +00:00

# MikroTik - UserManager

User details

▲ Main

Username: 00:18:DE:A0:95:0A  
 Password:   
 Disabled:   
 Owner: admin

▲ Actual profile

Actual profile:  
 Start time: 01/02/1970 00:00:32  
 End time: Unlimited  
 Time left: 0s  
 Download limit: Unlimited  
 Upload limit: Unlimited  
 Transfer limit: Unlimited  
 Uptime Limit: Unlimited  
 Rate limit:

▼ Constraints

IP address: 0.0.0.0  
 Bind on first use  
 Caller ID:   
 Shared users: Unlimited

▲ Wireless

Preshared key:   
 Enc key:   
 Enc algo: None

▲ Private information

First name:

Private information:

Preshared key:   
 Enc key:   
 Enc algo: None

▲ Private information

First name:   
 Last name:   
 Phone:   
 Location:   
 Comment:   
 Email:

▲ Statistics

Upload Used: 4.4 Mib  
 Download Used: 30.9 Mib  
 Uptime Used: 5h55m3s  
 Last used IP: 0.0.0.0  
 Last used MAC: 00-18-DE-A0-95-0A  
 Till time: Unlimited  
 Total time left: 0s

▲ Bill

Money paid: 0.00  
 Money used: 0.00  
 Money left: 0.00

▼ All profiles

+ test (10.00)

Show sessions Save

# MikroTik - Net Flow

```

http://192.168.89.1/accounting/ip.cgi
Najobľúbenejšie Ako začať Prehľad správ
192.168.89.1 255.255.255.255 416 4 * *
192.168.89.1 192.168.89.100 110697 519 * *
127.0.0.1 127.0.0.1 4152 24 * *
192.168.89.100 192.168.89.1 56354 774 * *

```

Still you have to do a user connection tracking and logging.

Slovak, Czech, etc.. – need to have a logging up to 6 months

# Net Flow – Stream –v.9

The screenshot shows two overlapping 'Traffic Flow Settings' windows. The background window is for port 1234, and the foreground window is for port 1300. Both windows show the following configuration:

- Status:**  Enabled
- Interfaces:** all (background) / wlan1 (foreground)
- Cache Entries:** 4k
- Active Flow Timeout:** 00:30:00
- Inactive Flow Timeout:** 00:00:15

At the bottom of each window, it indicates '1 item'.

# Net Flow – nfdUMP



nfDump – Open Source SW

Text based database engine

nfSen – Open Source SW

Update on the nfDump –

Graphical interface – uses a

RRDtool for a grapping

# Net Flow – nfdump



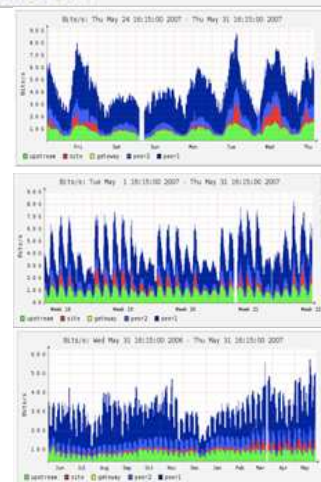
```
root@macka:/data/live/NAT-1/2010/02/21# nfdump -r nfcapd.201002211710 |more
```

Date	flow start	Duration	Proto	Src IP Addr:Port	Dst IP Addr:Port	Packets	Bytes	Flows
2010-02-21	17:09:28.310	13.690	TCP	206.222.227.78:80	-> 62.168.67.191:49327	7	5321	1
2010-02-21	17:09:42.020	0.000	UDP	94.112.75.117:7526	-> 213.215.112.124:1513	1	44	1
2010-02-21	17:09:42.020	0.000	TCP	69.63.176.189:80	-> 213.215.112.48:60785	2	290	1
2010-02-21	17:09:40.840	1.180	TCP	92.123.68.19:80	-> 213.215.112.12:49515	17	20359	1
2010-02-21	17:09:41.990	0.030	TCP	193.169.183.5:80	-> 62.168.67.191:49341	5	1005	1
2010-02-21	17:09:42.000	0.050	TCP	193.169.183.5:80	-> 62.168.67.191:49343	7	1962	1
2010-02-21	17:09:41.870	0.190	TCP	92.122.206.42:80	-> 213.215.112.12:49523	4	3029	1
2010-02-21	17:09:42.080	0.000	TCP	213.215.107.247:80	-> 62.168.67.222:3411	1	354	1
2010-02-21	17:09:41.880	0.220	TCP	69.63.178.137:80	-> 213.215.112.82:3362	4	370	1
2010-02-21	17:09:35.670	6.460	UDP	81.181.192.180:1513	-> 213.215.112.12:3161	2	88	1
2010-02-21	17:09:42.020	0.110	TCP	193.169.183.5:80	-> 62.168.67.191:49345	17	17980	1
2010-02-21	17:09:27.150	15.000	TCP	86.110.226.68:80	-> 213.215.112.12:50282	17	17869	1
2010-02-21	17:09:24.070	18.090	TCP	86.110.226.68:80	-> 213.215.112.12:50268	43	53381	1
2010-02-21	17:09:41.850	0.330	TCP	213.215.107.226:80	-> 62.168.67.222:3410	8	4997	1
2010-02-21	17:09:42.000	0.180	TCP	193.169.183.5:80	-> 62.168.67.191:49342	20	21096	1
2010-02-21	17:09:27.230	14.990	TCP	64.135.77.50:80	-> 213.215.112.98:1268	3	1042	1
2010-02-21	17:09:27.180	15.060	TCP	74.125.43.139:80	-> 213.215.112.98:1276	3	818	1
2010-02-21	17:09:42.250	0.000	ICMP	128.9.160.132:0	-> 213.215.112.46:0.0	1	28	1

# Net Flow – nfsen

NFSen - Profile live May 31 2007 - 04:40

	peer2	gateway	site	upstream
3.3 k/s	76.2 k/s	66.9 k/s	7.0 k/s	621.0 /s
1.7 k/s	484.6 Mb/s	459.9 Mb/s	12.5 Mb/s	437.3 kb/s
11.7 Ml	1.0 /s	651.0 /s	600.8 /s	46.6 /s
0 /s	3.7 /s	6.2 Mb/s	6.1 Mb/s	36.4 kb/s
0 b/s	4.4 kl	467.1 /s	8.9 k/s	6.1 k/s
2.0 k/s	181.7 /s	613.3 /s	38.8 Mb/s	28.3 Mb/s
7.4 Mb/s	104.0 kb/s	2.9 Ml	6.4 k/s	94.2 k/s
84.3 k/s	8.2 k/s	896.4 /s	766.7 /s	588.4 Mb/s
568.2 Mb/s	16.7 Mb/s	685.1 kb/s	2.8 Ml	



# FreeRadius

UserManager is better in:

- Integrated into one device
- Support
- Easy implementation
- Can start work in cca 1min
- Graphical Interface
- Affordable price

# FreeRadius

FreeRadius is better in:

- All possible add-ons, customized pages, all payment's support
- Not limited in any way
- Free of charge
- Database Support – SQL ....
- Made to be customized
- Speed

# FreeRadius

```
rlm_sql(sql): Adding client 10.199.190.254 (TNCSPOT25) to clients list
rlm_sql(sql): Released sql socket id: 4
Module: Checking preacct {...} for more modules to load
Module: Linked to module rlm_acct_unique
Module: Instantiating acct_unique
acct_unique {
    key = "User-Name, Acct-Session-Id, NAS-IP-Address, Client-IP-Address, NAS-Port"
}
Module: Linked to module rlm_files
Module: Instantiating files
files {
    usersfile = "/usr/local/etc/raddb/users"
    acctusersfile = "/usr/local/etc/raddb/acct_users"
    preproxy_usersfile = "/usr/local/etc/raddb/preproxy_users"
    compat = "no"
}
Listening on authentication address * port 1812
Listening on accounting address * port 1813
Listening on proxy address * port 1814
Ready to process requests.
```

# FreeRadius



HeidiSQL - [TravelNet - /travelnetcon/hotspots]

travelnetcon.hotspots: 48 records total

NAME_HOTSPOT	adress	City	Country	typ
TravelNetCon Office	M. Razusa 14		54368	180
Grand Maratha Sheraton			21660	94
Oaks Goldsbrough Apartments Sy	243 Pyrmont Street Darling Harbo		1301	13
Imperial Hotel New Delhi*****	Janpath New Delhi 110001		21700	94
Lisola (Boni)	Via Salvador Allende		23888	100
Fogl	Bratislavsk?? cesta		34373	180
I Cafe(test)	StaniÄ?n?? 11		54359	180
Qubus Hotel	ul. Nadwi??la??ska 6		32249	164
Cafe Sonnenstrasse	Sonnenstrasse 2		1588	14
Art` Oase	Egestorffstrasse 12		17856	77
Brezno Cafe Del Fun(test)	? kolsk?? 8		54359	180
Futureshop	Masarykova 6		34510	180
Okruzna1	Gagarinova 101		34510	180
TNC Spot V.Caric	Ivan Dolac Vinko Caric		54374	52
Pizzeria Romantik	R??banisko 2		54368	180
Sidisko 1. maja	Sidisko 1. maja		54385	180
Hotel Termal	Vyhne 249		54377	180
Vodny Raj Vyhne	Vyhne 249		54377	180
Re??taur??cia a Ä?erp. stanica	291		54378	180
KOMNET free	Hul		54379	180
MS - Parasutizme	LuÄ?enec 1		54368	180
Cemerne	Gorkeho 840/9		54385	180
TRAVELER	MOBILE-STATION		34390	180
XXXXX.sk	? kolsk?? 74		34510	180
XXXXX.sk	Jablo??ova 5		34510	180

# FreeRadius



TravelNetCon

Home | Search a hotspot | Partners | Support | About us

25 February 2008

Search a HOTSPOT

- select a country -

Search

Hotspot: Qubus Hotel Krakow  
Typ: Hotel Tarifa: 2€/h

**Qubus Hotel**

Map Satellite Hybrid

ul. NadwiÅ?laÅ?ska 6, Krakow  
Kategoria: Hotel  
Web: <http://www.qubushotel.com/>  
Tarifa: 2  
Lat: 50.047714233398  
Lon: 19.952962875366

Map data ©2008 PPMK, Tele Atlas

Home | Search a hotspot | Partners | Support | About us

# FreeRadius



## Connection statistic

Operator Last Invoice: Január 2008 from February 2008 Invoicing

Period 2007 Hotspot DATex Select a period 2007

Your Hotspots	January	February	March	April	May	June	July	August	September	October	November	December	Súčet
DATex..	0	0	0	0	0	0	2.93	-	0	-	0.01	0	2.96€
DATex..	-	-	-	-	-	-	11.22	0.55	-	0.23	-	8.5	20.49€
DATex..	-	-	-	-	-	-	-	11.05	-	-	-	-	11.05€
TravelNe..	-	-	-	-	-	-	-	-	-	-	-	-	0€
LCNet..	-	-	-	-	-	-	-	-	-	-	-	-	0€
Hotel P7..	-	-	-	-	-	-	-	-	-	-	-	-	0€
Grand Ma..	-	-	-	-	-	-	-	-	-	-	-	-	0€
Oaks Gol..	-	-	-	-	-	-	-	-	-	-	-	-	0€
Imperial..	-	-	-	-	-	-	-	-	-	-	-	-	0€
Lisola (..	-	-	-	-	-	-	-	-	-	-	-	-	0€
Hrad..	-	-	-	-	-	-	-	-	-	-	-	-	0€
<b>Total</b>	0€	0€	0€	0€	0€	0€	14.15€	11.6€	0€	0.23€	0.01€	8.5€	34.5€

- My Account
- Provider Statistics
- Show Map
- My Hotspots
- Order, Buy Voucher
- My Invoice
- Logout

Month	No. of Connections	Total Time of Connection	Value of Connection	Operator's Share
Jan	0	00:00:00	0	0
Feb	0	00:00:00	0	0
Mar	0	00:00:00	0	0
Apr	0	00:00:00	0	0
May	0	00:00:00	0	0
Jun	0	00:00:00	0	0
Jul	20	01:36:11	16.03	11.22
Aug	4	00:04:42	0.78	0.55
Sep	0	00:00:00	0	0
Oct	2	00:19:29	0.32	0.23
Nov	0	00:00:00	0	0
Dec	16	12:08:14	12.14	8.5
<b>Total</b>	<b>42</b>	<b>14:08:36</b>	<b>29.28</b>	<b>20.49</b>

# MIDDLEWARE - ServiceManager



Add-ON for the FreeRadius and nFDUMP,

- Service Management
- User Services Concentrator
- Radius Management
- Net Flow backup server

# MIDDLEWARE - ServiceManager



22:48:54

Administrácia | **Service Call** | Klienti | Organizér

Filter: Všetko  bez filtra =

Id	*Názov	Ulica	PSČ	Mesto	Email	Telefón	Mobil	Var syn
10	Barbora Anton	Prestavky 185	96605	Prestavky			0915820545	
9	Marcineková Lucia	Horná Trnávka 91	96605	Prestavky			0908577645	
8	Černák Radovan	Horná Trnávka 79	96605	Prestavky			0905286279	
7	Mlynár Branislav, Mgr.	Tajovského 8/137	96501	Žiar nad Hronom	mlynar@pc3000.sk		0949201155	
6	Pačová Emília	P.O.Hviezdoslava 51	96501	Žiar nad Hronom			0903590943	
4	Boldiš Peter	Prestavky 273	96605	Horná Trnávka			0908502282	
3	Hudec Ján	L. Majerského 555/4	96601	Hliník nad Hronom				
2	Pavlová Monika	Strojárska 361/7	96601	Hliník nad Hronom	ekonomy@centrum.sk	0904518154	0908855307	

# MIDDLEWARE - ServiceManager



## Netflow Processing

Source:   
  
  
  
  
 and

Options:

List Flows  Stat TopN

Top:

Stat:  order by

Aggregate:  proto  srcPort   
 dstPort

Limit:  Packets

Output:   / IPv6 long

```
** nfdump -M /netflow0/nfsen-demo/profile-data/live/peer1:peer2:gateway:site:upstream -T -r 2007/05/31/04/nfcapd.200705310441
nfdump filter:
any
Aggregated flows 2797250
Top 10 flows ordered by flows:
Date flow start      Duration Proto      Src IP Addr:Port    Dat IP Addr:Port    Packets  Bytes  Flows
2007-05-31 04:39:54.045  299.034 UDP      116.147.95.88:1110 -> 188.142.64.162:27014  68      5508   68
2007-05-31 04:39:56.282  298.174 UDP      116.147.249.27:1478 -> 188.142.64.163:27014  67      5427   67
2007-05-31 04:39:57.530  298.206 UDP      117.196.44.62:1031 -> 188.142.64.166:27014  67      5427   67
2007-05-31 04:39:57.819  298.112 UDP      117.196.75.134:1146 -> 188.142.64.167:27014  67      5427   67
2007-05-31 04:39:53.787  297.216 UDP      61.191.235.132:4121 -> 60.9.138.37:4121    62      3720   62
2007-05-31 04:39:55.354  300.833 UDP      60.9.138.37:2121 -> 118.25.93.95:2121   61      3660   61
2007-05-31 04:39:58.936  298.977 UDP      60.9.138.36:2121 -> 119.182.123.166:2121 61      3660   61
2007-05-31 04:39:54.329  303.585 UDP      120.150.194.76:2121 -> 60.9.138.37:2121   61      3660   61
2007-05-31 04:39:53.916  300.734 UDP      60.9.138.37:2121 -> 125.167.25.128:2121 61      3660   61
2007-05-31 04:39:57.946  300.353 UDP      60.9.138.36:2121 -> 121.135.4.186:2121  61      3660   61
```

## Resources

MikroTik - [wiki.mikrotik.com](http://wiki.mikrotik.com)  
- [forum.mikrotik.com](http://forum.mikrotik.com)

FreeRadius - [freeradius.org](http://freeradius.org)

Middle Ware – UserManagement [www.atheros.sk](http://www.atheros.sk)

Net Flow - [nfdump.sourceforge.net](http://nfdump.sourceforge.net)  
- [nfsen.org](http://nfsen.org)

OS - CentOS [www.centos.com](http://www.centos.com)

- Ubuntu Server edition [www.ubuntu.com](http://www.ubuntu.com)

## THANK'S FOR THE SUPPORT

Mikrotik



Alcoma s.r.o.  
Netcons s.r.o.  
Networkarena.eu



# ||| SHARE - EXPERIENCE

I would love tell this is really a great community. You should all be very, very proud. All of your contributions are invaluable.

I love to invite you at the discussion.



THANK you.