RADIUS MANAGER 4

INSTALLATION MANUAL

Version 4.0

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TABLE OF CONTENTS

FOREWORD

This document describes the installation procedure of Radius Manager billing system on a Linux host. The manual covers the following two major Linux branches:

1. **Redhat** based systems: Fedora Core 5-12, CentOS 5-6, RHEL 5+
2. **Debian** based systems: Debian 4+, Ubuntu 8+

For beginners we recommend the usage of Fedora Core 8-12, CentOS 5-6 or Ubuntu 8-11. Fedora Core and CentOS are the easiest and the most comfortable Linux system available nowadays. They come with all packages required by Radius Manager. The packages are available on the installation media and they are also downloadable from the official repositories using the Yum tool.

This manual covers the installation steps for Fedora Core 8-12, CentOS 5-6 and Ubuntu 8-11. Fedora Core 13-14 can be used with a little patience, while Fedora Core 15 and newer versions differ in many aspects what is not described in this manual. We recommend the usage of CentOS 5-6 over Fedora Core 13 or never version.

In this document You can also find guidelines how to configure RADIUS support on your NAS (Network Access Server) to use with Radius Manager system.

Radius Manager currently supports the following NASs:

1. **Mikrotik 2.8+** Use final releases only, the usage of RC (release candidate) versions are not recommended. The supported main features are: PPPoE, PPtP, L2tP, Hotspot and Wireless Access List authentication.
2. **Chillispot** running on Linux or on various DD-WRT devices. You can download a tested version from our download portal.
3. **StarOS v2 or v3** server. Supported features are: complete PPPoE and limited RADIUS Wireless Access List support.
4. **Cisco NAS** with correct IOS version. VPDN and Virtual template support is necessary to accept RADIUS authenticated PPPoE, PPtP and L2tP connections.
5. **pfSense** Hotspot server.

The **DOCSIS** license level adds support for **cable modem** based distribution system. You can use almost any CMTS (route or bridge mode). Only date capped billing plans are supported.

You have to complete the following steps in order to successfully install Radius Manager on your host:

1. Install **ionCube** runtime libraries
2. Build and configure **FreeRadius** server
3. Configure **MySQL** database and credentials
4. Install Radius Manager **WEB** components
5. Install Radius Manager **binaries**
6. Install and configure **DHCP server** (for DOCSIS version only)
7. Install **docsis utility** (for DOCSIS version only)
8. Complete the **post installation** steps and fine tuning

With the help of this installation manual You will be able to set up Radius Manager billing system on your host. If You have problems during the installation, please contact the customer support via the following email address: support@dmasoftlab.com

INSTALLATION

Prerequisites

The following components are required to successfully install and run the Radius Manager:

Hardware requirements:

- x86 compatible CPU (32 or 64 bit, single or multiple core)
- 1 GB RAM or more
- 80 GB HDD or more

Software requirements:

- FreeRadius 2.1.8 DMA mod 3 (downloadable from www.dmasoftlab.com)
- PHP 5 or better
- MySQL 5 or better
- 32 bit support (on 64 bit servers)
- mysql-devel
- php-mysql
- php-mcrypt
- php-snmp
- php-gd
- php-curl
- php-process (if available)
- net-snmp
- net-snmp-utils
- curl
- glibc 2.4 or better
- GNU C/C++ compiler
- DHCP server version 3 (for DOCSIS only)
- IonCube runtime libraries
- Javascript enabled WEB browser

Optional components:

- **Webmin** – for configuring the Linux system
- **phpMyAdmin** – for maintaining MySQL databases
- **Midnight Commander** – all-in-one system management tool.

Preparing the Linux system

Fedora 8-12, CentOS 5-6

Make sure all necessary components are available on your Linux host before You proceed the installation of Radius Manager.

1. **Disable SeLinux** in */etc/sysconfig/selinux* and reboot your host:

```
SELINUX=disabled
```

2. On **Fedora Core 5-10** and **CentOS 5-6** install all packages in one step:

```
[root@localhost]# yum install mc wget make gcc libtool-ltdl curl mysql-server mysql-devel
net-snmp net-snmp-utils php php-mysql php-mcrypt php-gd php-snmp php-process
```

On **Fedora Core 11-12** do not install **libtool-ltdl-devel**. Delete it if already installed:

```
[root@localhost]# rpm -e libtool-ltdl-devel
[root@localhost]# yum install mc wget make gcc libtool-ltdl curl mysql-server mysql-devel
net-snmp net-snmp-utils php php-mysql php-mcrypt php-gd php-snmp php-process
```

On a 64 bit server install the 32 bit support package:

```
[root@localhost]# yum install glibc.i386
```

or

```
[root@localhost]# yum install glibc.i686
```

Without these packages Radius Manager binaries will not start (reporting “no such command is available” etc., however the executable files are installed properly in */usr/local/bin* directory and permissions are correct).

On some CentOS versions *mcrypt* is unavailable in the official repositories. If You are unable to download *php-mcrypt* with **yum**, download **libmcrypt** and **php-mcrypt** from http://dmasoftlab.com/cont/downloads and install both packages with **rpm** command:

```
[root@localhost]# rpm -i libmcrypt-2.5.8-9.el6.i686.rpm
[root@localhost]# rpm -i php-mcrypt-5.3.2-3.el6.i686.rpm
```

Download and install the correct versions for your Linux architecture (32 or 64 bit).

Compiling FreeRadius on **Fedora Core 13-14** is a bit complicated due to a incompatibility in libtool package. The procedure is described in FreeRadius installation chapter.

Debian 4+, Ubuntu 7+

Install the required packages in one step if You are planning to use Radius Manager on Debian or Ubuntu system:

```
[root@localhost]# apt-get install mc wget rcconf make gcc mysql-server mysql-client
libmysqlclient15-dev libperl-dev curl php5 php5-mysql php5-cli php5-curl php5-mcrypt
php5-gd php5-snmp
```

Download and install libtool 1.x from http://www.dmasoftlab.com/downloads if FreeRadius won't compile with the current libtool package.

```
[root@localhost]# wget http://www.dmasoftlab.com/cont/download/libltdl3_1.5.24-
1ubuntu1_i386.deb
[root@localhost]# wget http://www.dmasoftlab.com/cont/download/libltdl3-dev_1.5.24-
1ubuntu1_i386.deb
[root@localhost]# dpkg -i libltdl3_1.5.24-1ubuntu1_i386.deb
[root@localhost]# dpkg -i libltdl3-dev_1.5.24-1ubuntu1_i386.deb
```

On a **64 bit system** use the following libtool packages:

```
[root@localhost]# wget http://www.dmasoftlab.com/cont/download/libltdl3_1.5.26-
1ubuntu1_amd64.deb
[root@localhost]# wget http://www.dmasoftlab.com/cont/download/libltdl3-dev_1.5.26-
1ubuntu1_amd64.deb
[root@localhost]# dpkg -i libltdl3_1.5.26-1ubuntu1_amd64.deb
[root@localhost]# dpkg i libltdl3-dev_1.5.26-1ubuntu1_amd64.deb
```

Remove the actual libtool package if dpkg reports conflict with the already installed version:

```
[root@localhost]#  dpkg --remove [package_name]
```

After removing the conflicting package install the correct version with **dpkg**.

On a 64 bit server it is required to install the 32 bit support package:

```
[root@localhost]# apt-get install ia32-libs
```

Without these packages Radius Manager binaries will not start (reporting "no such command is

available” etc., however the executable files are installed properly in */usr/local/bin* directory and permissions are correct).

Installation procedure of ionCube runtime system

Radius Manager requires ionCube runtime libraries. You can download them from:

http://www.dmasoftlab.com/downloads

Before installing ionCube, You need to know the following:

1. The **architecture** of your Linux system (32 or 64 bit)
2. The **PHP version** You are using
3. The location of **php.ini** file

Example ionCube installation

1. Copy and untar the **ionCube runtime libraries** (32 or 64 bit – use the correct archive) to */usr/local/ioncube*. Use Midnight Commander or other tool.

2. Add the appropriate **ionCube loader** to your *php.ini*. For example, on a Linux system with PHP 5.2.2 You have to add the following line:

```
zend_extension=/usr/local/ioncube/ioncube_loader_lin_5.2.so
```

Be sure to set the correct PHP version in the zend_extension line. If there are other zend_extension entries in the php.ini file, place this new entry before all existing entries.

Please note on Debian based systems there are **two php.ini** files:

/etc/php5/apache2/php.ini
/etc/php5/cli/php.ini

You have to add the ionCube loader to **both files**. On Fedora there is only one *php.ini* available (*/etc/php.ini).*

3. **Test** the **ionCube** loader from shell:

```
[root@localhost]# php -v
PHP 5.1.2 (cli) (built: Feb 28 2006 06:21:15)
Copyright (c) 1997-2006 The PHP Group
Zend Engine v2.1.0, Copyright (c) 1998-2006 Zend Technologies
    with the ionCube PHP Loader v3.1.31, Copyright (c) 2002-2007, by ionCube Ltd.
```

You have to see the ionCube PHP Loader version displayed correctly.

4. **Restart** the web server (Fedora):

```
[root@localhost]# sevice httpd restart
```

On Debian:

```
[root@localhost]# apache2ctl restart
```

5. Run **ifconfig** command from shell to determine the MAC address of the network interface card (NIC):

```
[root@localhost]# ifconfig
eth0   Link encap:Ethernet  HWaddr 00:00:E8:EC:8A:E8
       inet addr:192.168.0.3  Bcast:192.168.0.255  Mask:255.255.255.0
       inet6 addr: fe80::200:e8ff:feec:8ae8/64 Scope:Link
       UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
       RX packets:19104 errors:0 dropped:0 overruns:0 frame:0
       TX packets:13287 errors:0 dropped:0 overruns:0 carrier:0
       collisions:0 txqueuelen:1000
       RX bytes:3683486 (3.5 MiB)  TX bytes:6942105 (6.6 MiB)
       Interrupt:10 Base address:0xd800
```

6. Now it's time to **request a license** for your server. Log on to DMA Softlab customer's portal (https://customers.dmasoftlab.com) and request a **trial license** for the **hardware address** (MAC address) of your network interface card.

Radius Manager will run only on the specified host. The license is bound to the MAC address of the network interface card. You can migrate Radius Manager to another host easily if You install the old, licensed network interface card in the new server.

It is strongly recommended to request a license for a **removable networking interface** to allow migration to new host without loosing the license.

7. Once the license file is issued (You will get a notification in email) download and copy the *lic.txt* and *mod.txt* to **radiusmanager** web directory (read the "Installation procedure of Radius Manager" chapter of this manual) to enable the licensing of your Radius Manager system.

Troubleshooting the ionCube loader system

If encoded files fail to run, you can test ionCube runtime by using the helper PHP script **ioncube-loader-helper.php** which is included in the loader download archive.

1. **Copy** the *ioncube-encoded-file.php* PHP script to your **http root** (on Redhat-based system it is */var/www/html*).

2. Try to **access** the *ioncube-encoded-file.php* script using your favorite web browser:

   http://yourhost/ioncube-encoded-file.php

3. If You can see the message "*This file has been successfully decoded. ionCube Loaders are correctly installed*", it means You have successfully installed ionCube runtime on your host. If You can't decode the file via a HTTP call, check the php.ini and be sure **SeLinux is disabled**.

Notes about PHP safe mode

PHP safe mode (if enabled in php.ini) avoids the execution of UNIX commands called by Radius Manager (via shell_exec) if additional parameters are not configured properly. We recommend to turn off the PHP safe mode to enable all functionalities of Radius Manager. Please always check the Apache log if You encounter any PHP / Apache related problems (in */var/log* directory).

Installation procedure of FreeRadius

Complete the following steps to build, install and configure FreeRadius RADIUS server on your host. Use FreeRadius 2.1.8 DMA mod 3 source archive only (downloadable from our site). It is prepared and tested by our team and it is 100% compatible with Radius Manager.

Other versions and builds will not function properly with Radius Manager. If your host already has a different FreeRadius version installed, remove it completely including it's configuration files (*/usr/local/etc/raddb*).

Execute the following actions as root user:

1. **Download FreeRadius** tar archive from the following URL:

   http://www.dmasoftlab.com/downloads

2. Build **FreeRadius** server from sources.

Ungzip and untar the FreeRadius archive:

```
[root@localhost]# gzip -d freeradius-server-2.1.8-dmamod-3.tar.gz
[root@localhost]# tar xvf freeradius-server-2.1.8-dmamod-3.tar
```

Create the makefile:

```
[root@localhost]# cd freeradius-server-2.1.8
[root@localhost]# ./configure
```

On some 64 bit systems it is necessary to specify the MySQL library path:

```
[root@localhost]# ./configure --with-mysql-lib-dir=/usr/lib64/mysql
```

Build and install the system:

```
[root@localhost]# make
[root@localhost]# make install
```

Be sure You have the **mysql-devel** package installed. By default FreeRadius will be installed in */usr/local* directory.

The following trick might help if MySQL won't compile even after installing the correct libtool packages (consult chapter "Preparing the Linux system" for details).

Issue **make install** to install the incomplete FreeRadius package. Now open **freeradius-server-2.1.8/src/modules/rlm_eap/Makefile** in any text editor and add **-lfreeradius-radius-2.1.8** to it:

```
radeapclient: radeapclient.lo $(CLIENTLIBS)
    $(LIBTOOL) --mode=link $(CC) $(LDFLAGS) -lfreeradius-radius-2.1.8 $(RLM_LDFLAGS)
-o radeapclient radeapclient.lo $(CLIENTLIBS) $(LIBS) $(OPENSSL_LIBS)
```

Issue **make** again which should work now. Issue **make install** to install the final build.

3. **Test** FreeRadius in debug mode. Start it with parameter -X (upper case X):

```
[root@localhost]# radiusd -X
...
Listening on authentication address * port 1812
Listening on accounting address * port 1813
Listening on command file /usr/local/var/run/radiusd/radiusd.sock
Listening on proxy address * port 1814
Ready to process requests.
```

It answers with "*Ready to process requests*". If *radiusd* cannot find the required libraries, issue *ldconfig* from shell to refresh the ld linker cache.

```
[root@localhost]# ldconfig
```

If there are still problems, please contact the customer support using the following email address:

support@dmasoftlab.com.

4. **Set** the correct **ownership** on FreeRadius configuration files (Fedora):

```
[root@localhost]# chown apache /usr/local/etc/raddb
[root@localhost]# chown apache /usr/local/etc/raddb/clients.conf
```

On Debian:

```
[root@localhost]# chown www-data /usr/local/etc/raddb
[root@localhost]# chown www-data /usr/local/etc/raddb/clients.conf
```

Radius Manager updates the *clients.conf* automatically, so it is necessary to set the correct permission on it. **Do not modify** the clients.conf by hand. Don't forget to define all NASs in ACP with correct secret. Restart *radiusd* (from ACP or from shell) after updating the NAS list.

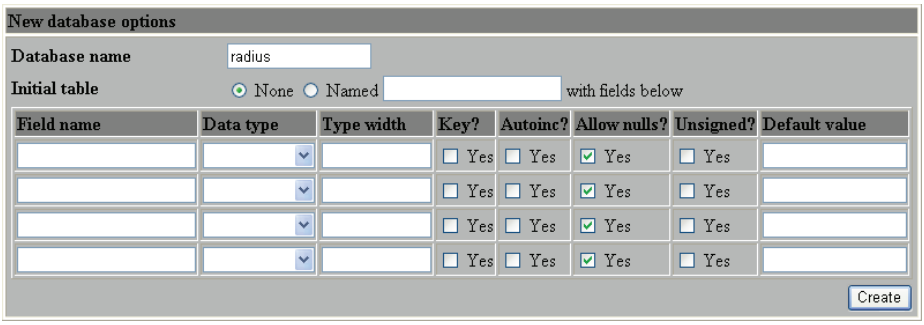
5. **Review** and edit (if required) the **MySQL credentials** in */usr/local/etc/raddb/sql.conf*:

```
# Connection info:
server = “localhost”
#port = 3306
login = “radius”
password = “radius123”
```

6. Create **MySQL databases** and **credential**. Two methods are described: **MySQL** command line tool and **Webmin**.

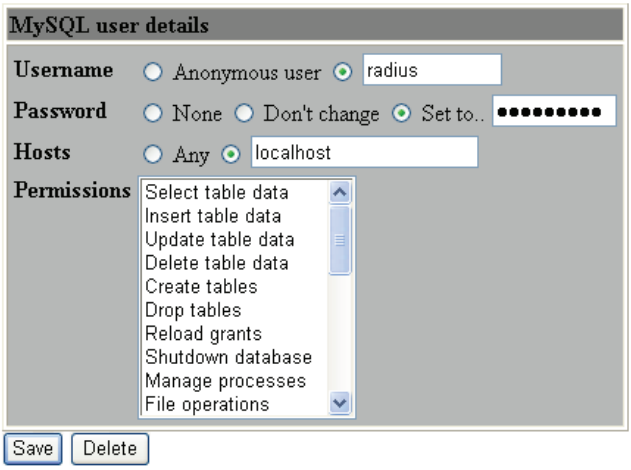
Preparing MySQL databases with Webmin

Webmin method is ideal for beginners. Create the RADIUS and CONNTRACK databases with it:

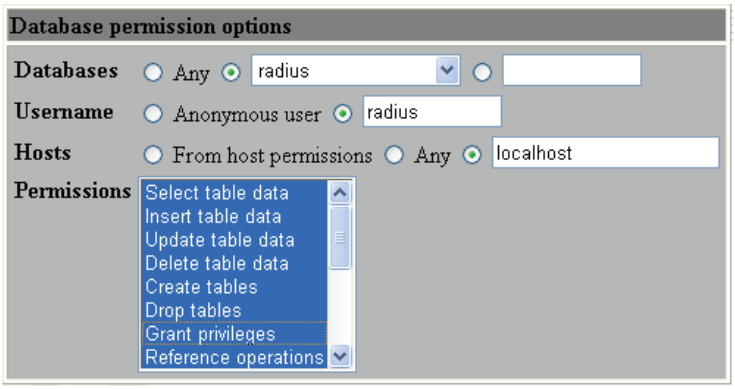


Define the database name in the proper field (first create RADIUS then CONNTRACK).

Create **database users**. For initial installation use password **radius123** for user **radius** and **conn123** for user **conntrack**.



Don't forget to define the **host permissions**. Select all permissions for both **radius** and **conntrack** users.



Creating MySQL databases with MySQL command line tool

If You are familiar with MySQL command line tool You can create databases, users and permissions in one step.

Log on to MySQL server as root:

```
[root@localhost]# mysql -u root -ppassword
```

where *password* is the MySql root password. If there is no password for root, simply invoke MySQL CLI tool with **mysql** command.

Execute the following commands from the MySQL command shell:

```
CREATE DATABASE radius;
CREATE DATABASE conntrack;
CREATE USER ‘radius’@’localhost’ IDENTIFIED BY ‘radius123’;
CREATE USER ‘conntrack’@’localhost’ IDENTIFIED BY ‘conn123’;
GRANT ALL ON radius.* TO radius@localhost;
GRANT ALL ON conntrack.* TO conntrack@localhost;
```

Completing this step the databases are ready to use.

Installation procedure of Radius Manager

There are two installation methods available:

1. **Interactive**, using the *install.sh* script.
2. **Manual** installation, using Unix commands and / or Midnight Commander.

Interactive installation

The easiest way to install Radius Manager is to use the included *install.sh* script. It is located in Radius Manager tar archive and can be used on Redhat and Debian based systems. Before You begin, be sure You have prepared the MySQL database tables and credentials. Radius Manager requires two databases:

1. **RADIUS** – for storing the system data, including users and accounting information.
2. **CONNTRACK** – for storing the Connection Tracking System (CTS) data. Create both databases even on a non-CTS system.

After You decompress the Radius Manager tar archive (use command *tar xf [filename]*), invoke the installer script, but first change its permission to 755. In the examples below we will use the installer script on Redhat / Fedora system.

```
[root@localhost]# chmod 755 install.sh
[root@localhost]# ./install.sh
Radius Manager installer
Copyright 2004-2012, DMA Softlab LLC
All right reserved.

(Use CTRL+C to abort any time)

Select the type of your operating system:
1. Redhat (Fedora, CentOS etc.)
2. Debian (Ubuntu etc.)

Choose an option: [1]
```

Select the operating system You have. For Redhat, RHEL, CentOS and Fedora select option **1**. If You have Debian or Ubuntu select **2**.

Select the installation method:

```
Select installation type:
1. New installation
2. Upgrade old system

Choose an option: [1]
```

Use option **1** for new installation. The default option is displayed after each question, so You can just

press enter in most cases.

```
Choose an option: [1]
Selected installation method: NEW INSTALLATION
WWW root path: [/var/www/html]
```

Enter the **HTTP root directory**. The installer will create *radiusmanager* subdirectory in it. On Redhat You can simply press enter.

Enter the MySQL database credentials (they were defined when You have pepared the databases):

```
RADIUS database host: [localhost]
RADIUS database username: [radius]
RADIUS database password: [radius123]
CTS database host: [localhost]
CTS database username: [conntrack]
CTS database password: [conn123]
```

For the default setup simply press enter and use MySQL user "**radius**" with password "**radius123**" for **RADIUS** database, and "**conntrack**" / "**conn123**" for **CONNTRACK** database. The host is "**localhost**" by default. If You have different setup, specify proper values.

It is strongly recommended to use a separate database host for the CONNTRACK database If You are planning to control hundreds of online users, .

In the next step You have to define the FreeRadius user. It must be the correct user to set the permission properly on /etc/*radiusmanager.cfg*. Radius Manager binaries will not start if there is a permission problem on /etc/*radiusmanager.cfg*.

```
Freeradius UNIX user: [root]
```

On Fedora and Debian it is **root**, so simply press enter.

Now define the HTTP user (the user name under Apache is running). It is required to set the permission on files in *radiusmanager/config* directory. On Fedora it is **apache**, while on Debian it is **www-data**.

```
Httpd UNIX user: [apache]
```

You can now decide to create **rmpoller** service or not? It is a standard Fedora / Debian compatible service script which invokes rmpoller helper. You can also start rmpoller using alternative ways.

```
Create rmpoller service: [y]
```

In most cases simply press enter. When a service has been created, You can use the command (on Fedora)

service rmpoller [start | stop]

to control **rmpoller** service activity. Also make this service auto starting at boot time together with FreeRadius. Use command *chkconfig* command (on Fedora) or Webmin to activate the service at boot time. Rmpoller must be **running all the time**, so be 100% sure it is started automatically.

In the next step select yes if You want to create the **rmconntrack** service. It is a standard Linux service, like rmpoller. It is required for **Radius Manager CTS** only.

```
Create rmconntrack service: [y]
```

When a service has been created, You can use the command

service rmconntrack [start | stop]

to control **rmconntrack** service activity. Also make this service auto starting at boot time.

It is strongly recommended to create a full database backup before You continue. Answer '**y**' to the following question:

```
Back up RADIUS database: [y]
```

Now the system warns You: it will **overwrite** the existing databases if You continue. Press '**y**' to continue or '**n**' to abort the installation process.

```
WARNING! If You continue You will overwrite the existing RADIUS database!

Are You sure to start the installation? [n]
```

You can press **Ctrl+C** any time to abort the installation process.

```
Starting installation process...

Backing up radiusmanager.cfg
Copying WEB content to /var/www/html/radiusmanager
Copying binaries to /usr/local/bin
Copying rootexec to /usr/local/sbin
Copying radiusmanager.cfg to /etc
Backing up RADIUS database...
Creating MySQL tables
Enabling rmpoller service at boot time
Enabling rmconntrack service at boot time
Enabling radiusd service at boot time
Copying logrotate script
Copying cronjob script
Setting permission on raddb files

Installation complete!
```

Install the **license files** (*lic.txt* and *mod.txt*) in radiusmanager WEB directory and try to access the ACP (Administration Control Panel). Reboot your system to check if helper services are started properly (radiusd, rmpoller and optionally rmconntrack).

To test the RADIUS communication start **radiusd** in **debug mode**:

```
[root@localhost]# radiusd -X
...
Listening on authentication address * port 1812
Listening on accounting address * port 1813
Listening on command file /usr/local/var/run/radiusd/radiusd.sock
Listening on proxy address * port 1814
Ready to process requests.
```

On the second terminal issue the following **radtest** command:

```
[root@localhost]# radtest user 1111 localhost 1812 testing123
Sending Access-Request of id 57 to 127.0.0.1 port 1812
        User-Name = “user”
        User-Password = “1111”
        NAS-IP-Address = 127.0.0.1
        NAS-Port = 1812
rad_recv: Access-Accept packet from host 127.0.0.1 port 1812, id=57, length=50
        WISPr-Bandwidth-Max-Up = 262144
        WISPr-Bandwidth-Max-Down = 262144
        Acct-Interim-Interval = 60
```

You have to see **Access-Accept** answer. If You see an error message, check the following:

- Is MySQL server running?
- Are MySQL credentials correct?
- Are MySQL table permissions correct?
- Can FreeRadius connect to MySQL database?
- Have You created the RADIUS and CONNTRACK databases and tables?
- Is the NAS defined in ACP? In this case it is 127.0.0.1 ?(NAS-IP-Address = 127.0.0.1).
- If the hostname is different than localhost, You have to substitute the localhost with the IP address of the Linux server. You have to update the NAS list in RM ACP in this case.

You will see the detailed error message in the **radiusd -X** debug output.

If there are errors like *"Ignoring request from unknow NAS"* or *"NAS not found"*, the NAS is not defined in ACP. Stop the running radius daemon and determine the correct NAS IP address:

```
[root@localhost]# service radiusd stop
```

or

```
[root@localhost]# ps ax | grep radius
[root@localhost]# kill [pid]
```

Substitute the PID with the displayed PID (process id). Now invoke the debug mode:

```
[root@localhost]# radiusd -X
```

Try **radtest** or try to authenticate users on a real NAS. In the debug output You will see the correct *NAS-IP-Address* what You have to enter in Radius Manager ACP / Edit NAS form.

Don't forget to restart radiusd after making changes to the NAS list!

Manual installation

1. Copy **rmauth, rmacnt, rmpoller** and **rmconntrack** binaries to */usr/local/bin* directory with **cp** or **Midnight Commander**.

2. Set **755 permission** on all files:

```
[root@localhost]# chmod 755 /usr/local/bin/rmauth
[root@localhost]# chmod 755 /usr/local/bin/rmacnt
[root@localhost]# chmod 755 /usr/local/bin/rmpoller
[root@localhost]# chmod 755 /usr/local/bin/rmconntrack
```

3. Copy **radiusmanager.cfg** to */etc* folder.

4. Edit the **parameters** in /etc/*radiusmanager.cfg* to fit your needs.

5. Change **permission** on /etc/*radiusmanager.cfg* to ensure only FreeRadius user can access it:

```
[root@localhost]# chmod 600 /etc/radiusmanager.cfg
[root@localhost]# chown root.root /etc/radiusmanager.cfg
```

You have to **chown** this file to the correct user. It must be the user under FreeRadius is running, (**root** in most cases) otherwise the binaries will be unaable to read the configuration file.

6. Test **rmauth** from shell:

```
[root@localhost]# rmauth -v
rmauth version 4.0.0, build 4225 (20120207)
Copyright 2004-2012, DMA Softlab
All rights reserved.
```

You have to see similar output to this. If there are errors, maybe You have an older glibc installed or some other libraries are missing. In this case try to install the missing packages. It You fail, contact the customer support (support@dmasoftlab.com).

Test the database connectivity:

```
[root@localhost]# rmauth 192.168.0.8 user 1
Mikrotik-Xmit-Limit=1028,Mikrotik-Rate-Limit=”262144/262144”
```

You have to see similar output to this. If there is a MySQL socket error, define the correct socket location in */etc/radiusmanager.cfg*. The default socket file on Redhat is **/var/lib/mysql/mysql.sock**. On Debian the proper socket path is **/var/run/mysqld/mysqld.sock**.

To successfully test *rmauth*, You have to create NAS entries in ACP. In this example the NAS IP 192.168.0.8 was already defined in Radius Manager ACP and set as Mikrotik. You have to restart

radiusd each time when You update the NAS list in ACP. Unfortunately FreeRadius doesn't read the configuration files dynamically.

7. Copy **rootexec** to */usr/local/sbin* folder.

8. Change **permission** on *rootexec* to 4755:

```
[root@localhost]# chmod 4755 /usr/local/sbin/rootexec
```

Rootexec is required to execute external UNIX commands from Radius Manager WEB interface. For security purposes it uses a password. The password forbids the executions of binaries by anyone who can install a PHP script on the accounting server.

9. Copy the **radiusmanager** cron file to */etc/cron.d* and set the correct permission on it:

```
[root@localhost]# chmod 644 /etc/cron.d/radiusmanager
```

10. **Copy** the complete Radius Manager WEB content to **http root** directory.

11. **Protect** the configuration files in *radiusmanager/config* directory to be readable by **root** and **Apache** only (on Debian it is the **www-data** user):

```
[root@localhost]# cd /var/www/html/radiusmanager/config
[root@localhost]# chown apache 2co_cfg.php authorizenet_cfg.php dps_cfg.php netcash_cfg.php paypal_cfg.php system_cfg.php
[root@localhost]# chmod 600 2co_cfg.php authorizenet_cfg.php dps_cfg.php netcash_cfg.php paypal_cfg.php system_cfg.php
```

12. Set the correct owner of **tmpimages** directory. Without it the online user list will report the error message "*Unable to create image".*

On Fedora:

```
[root@localhost]# chown apache /var/www/html/radiusmanager/tmpimages
```

On Debian:

```
[root@localhost]# chown www-data /var/www/radiusmanager/tmpimages
```

13. **Edit** the system settings in *system_cfg.php* and optionally in other configuration files in *config* directory. Read the **Reference** chapter for details.

14. **Install** initial database **tables.** Use **MySQL** command line tool:

```
[root@localhost]# mysql -u radius -pradius123 radius < radius.sql
[root@localhost]# mysql -u conntrack  -pconn123 conntrack < conntrack.sql
```

15. Start your WEB browser and check the functionality of the **Administration Control Panel** (ACP):

http://yourhost/radiusmanager/admin.php

Use the following username and password:

Username: admin
Password: 1111

Log in and try to access various functions.

Also test the functionality of the **User Control Panel** (UCP):

http://yourhost/radiusmanager/user.php

The initial username and password are:

Username: user
Password: 1111

To be able to log on to UCP as another user, create the user in ACP first.

MySQL optimization

The performance of the entire Radius Manager system mainly depends on the speed of the hard disk and the MySQL server. If You encounter performance issues, check the following:

1. Check **radacct** table **size**. If it is large (> 300-500 MB), delete the past years from it using the *deloldyears.sql* script (included in the RM tar archive in *doc* directory).
2. **Add** more **RAM** to the system. Adding 2-4 GB of RAM doesn't mean any problem nowadays.
3. Use **RAID 0** or **RAID 5** array MySQL db storage devices.
4. **Optimize** the **MySQL** server via *my.cnf* file.

```
innodb_buffer_pool_size=512M
innodb_log_file_size=128M
innodb_flush_log_at_trx_commit=2
innodb_file_per_table
innodb_flush_method=O_DIRECT
```

Set **innodb_buffer_pool_size = 75%** of RAM size and **innodb_log_file_size = 25%** of innodb_ buffer_pool_size.

Delete the files **ib_logfile0** and **ib_logfile1** in */var/lib/mysql* directory and **restart MySQL** server.

Adding more RAM will drastically speed up the MySQL system. Indexes have to be fit in the RAM for optimal performance.

Notes

By default the WEB server lists the contents of the directory where Radius Manager files are stored. To avoid this there are several methods available:

1. **Use .htaccess file.** Enable the **Options -Indexes** directive In *.htaccess* file (example file is included in *radiusmanager* directory in the installation archive). Be sure to enable the htaccess support in order to use this feature (set **AllowOverride All** directive in *httpd.conf*). Radius Manager is shipped with preconfigured .htaccess files.

2. **Disable the directory listing** in Apache configuration file.

SOFTWARE UPDATE

There are two update modes available:

1. **Interactive**
2. **Manual**

Both methods require manual installation and configuration of FreeRadius server. This task is described here first.

Updating FreeRadius

The current version of Radius Manager system requires FreeRadius 2.1.8 DMA mod 3. Delete the old and install the new version on your host.

Read the appropriate chapter of this manual how to install the FreeRadius server. Before You proceed the installation of the new FreeRadius version, **rename** the **raddb** directory to **raddb.bak** to permit FreeRadius to install the new configuration files. Without this step the configuration files will be remain unchanged and FreeRadius will not function properly with the old format, incompatible configuration files.

Configure FreeRadius using the files in **raddb** directory as it is described in the FreeRadius installation chapter. Do not forget to set the proper **permission** on **raddb** files.

Optimizing MySQL for InnoDB

Radius Manager v 4.0.0 or later uses InnoDB tables instead of MyISAM. InnoDB is faster and uses row level locking mechanism instead of table level locking. Radius Manager is more responsive with InnoDB.

Before beginning the upgrade it is important to **optimize** the **MySQL** server. Add the following entries (or edit if they already exist) to *[mysqld]* section in */etc/my.cnf*:

```
innodb_buffer_pool_size=512M
innodb_log_file_size=128M
innodb_flush_log_at_trx_commit=2
innodb_file_per_table
innodb_flush_method=O_DIRECT
```

Set **innodb_buffer_pool_size = 75%** of RAM size and **innodb_log_file_size = 25%** of innodb_ buffer_pool_size.

Delete the files **ib_logfile0** and **ib_logfile1** in */var/lib/mysql* directory and **restart MySQL** server.

Without this optimization the upgrade procedure can last several hours and the overall system performance will be poor.

Interactive update

Radius Manager installer script can update the existing system automatically. First at all stop the running Radius Manager daemon (Redhat):

```
[root@localhost]# service rmpoller stop
[root@localhost]# service rmconntrack stop
```

On other systems use the following method (it can also be used on Redhat). Be sure to enter the correct PID as the argument of the **kill** command.

```
[root@localhost]# ps ax | grep rm
10205 ?        Ssl    0:25 /usr/local/bin/rmpoller
15917 ?        Ssl    5:08 /usr/local/bin/rmconntrack
[root@localhost]# kill 10205
[root@localhost]# kill 15917
```

Decompress the Radius Manager tar archive. CD to its folder and run the **install.sh** script. If the script isn't executable, change the **permission** to **755**:

```
[root@localhost]# chmod 755 install.sh
[root@localhost]# ./install.sh
Radius Manager installer
Copyright 2004-2012, DMA Softlab LLC
All right reserved.

(Use CTRL+C to abort any time)

Select installation type:

1. New installation
2. Upgrade old system
3. Exit

Choose an option: [1] 2
```

Select option **2** for upgrading the current system. After that choose the **currently installed** Radius Manager version.

WARNING! Be sure to select the correct installed version, otherwise the database gets corrupted!

```
Selected installation method: UPGRADE

0.  v1.1.5
1.  v2.0.0
2.  v2.0.1
3.  v2.0.2
4.  v2.5.0
5.  v2.5.1
6.  v3.0.0
7.  v3.0.1
8.  v3.1.0
9.  v3.1.1
10. v3.1.2
11. v3.2.0
12. v3.2.1
13. v3.2.2
14. v3.3.0
15. v3.4.0
16. v3.4.1
17. v3.5.0
18. v3.6.0
19. v3.6.1
20. v3.7.0
21. v3.8.0
22. v3.9.0

Select current installed version: 5
```

After selecting the correct (installed) Radius Manager version, enter the location of the **HTTP root** directory (webroot):

```
Current installed version is 2.5.1
WWW root path: [/var/www/html]
Directory /var/www/html/radiusmanager already exists. Overwrite? [n]
```

It will ask to allow overwriting the existing files in *radiusmanager* directoryor not? Enter '**y**' to this question. The installer will back up the configuration files in *config* folder, so You can migrate the existing configuration later.

Now enter the MySQL database access data:

```
RADIUS database host: [localhost]
RADIUS database username: [radius]
RADIUS database password: [radius123]
CTS database host: [localhost]
CTS database username: [conntrack]
CTS database password: [conn123]
```

Assuming the default setup simply press enter and use MySQL user “**radius**” with password “**radius123**” for RADIUS database and “**conntrack**“, “**conn123**” for CONNTRACK database. The host is “**localhost**” by default. If You have different setup enter the correct data. It is recommended to use a separate MySQL db host for the CONNTRACK database if You use the system to control hundreds of online users,

Define the FreeRadius user. It must be the correct user to set the permission on *radiusmanager.cfg.* If there are permission problems on *radiusmanager.cfg*, helper binaries will not work properly.

```
Freeradius UNIX user: [root]
```

On Fedora it is **root**, so simply press enter.

Now define the HTTP user (the username under Apache is running). On Fedora it is the **apache** user, while on Debian it is **www-data**. This step is required to set the correct permission on configuration files in *config* directory.

```
Httpd UNIX user: [apache]
```

You can now decide to create **rmpoller** service or not? It is a standard Linux service which invokes rmpoller helper. You can also start rmpoller in alternative ways.

```
Create rmpoller service: [y]
```

On Fedora simply press enter. When the service has been created, You can use the command

service rmpoller [start | stop]

to control the **rmpoller** service activity. Also make this service auto starting at boot time, together with FreeRadius.

Choose “**y**” if You want to create the **rmconntrack** service. It is a standard Fedora service like rmpoller. It is required by **Radius Manager CTS** only.

```
Create rmconntrack service: [y]
```

When a service has been created, You can use the command

service rmconntrack [start | stop]

to control the **rmconntrack** service activity. Make this service auto starting at boot time.

It is strongly recommended to create a full database backup before You continue. Answer ‘**y**’ to the following question:

```
Create database backup: [y]
```

When all data were entered the system will ask You to begin the upgrade procedure:

```
WARNING! Create a full database backup before You proceed!

Are You sure to start the upgrade? [n]
```

Be sure You have created a **full database backup** before starting the upgrade procedure!

Press '**y**' to continue with the upgrade or '**n**' to abort the process.

You can use **Ctrl+C** any time to abort the installation process.

```
Starting installation process...

Stopping daemon: rmpoller
Stopping daemon: rmconntrack
Backing up radiusmanager.cfg
Backing up system_cfg.php
Backing up netcash_cfg.php
Backing up paypal_cfg.php
Backing up authorizenet_cfg.php
Backing up dps_cfg.php
Backing up 2co_cfg.php
Copying WEB content to /var/www/html/radiusmanager
Copying binaries to /usr/local/bin
Copying rootexec to /usr/local/sbin
Copying radiusmanager.cfg to /etc
Backing up RADIUS database...
Upgrading MySQL tables. Please be patient.
Upgrading to version 3.0.0
Upgrading to version 3.0.1
Upgrading to version 3.1.0
Upgrading to version 3.1.1
Upgrading to version 3.1.2
Upgrading to version 3.2.0
Upgrading to version 3.2.1
Upgrading to version 3.2.2
Upgrading to version 3.3.0
Upgrading to version 3.4.0
Upgrading to version 3.4.1
Upgrading to version 3.5.0
Upgrading to version 3.6.0
Upgrading to version 3.6.1
Upgrading to version 3.7.0
Upgrading to version 3.8.0
Upgrading to version 3.9.0
```

```
Upgrading to version 4.0.0
Enabling rmpoller service at boot time
Enabling rmconntrack service at boot time
Enabling radiusd service at boot time
Copying logrotate script
Copying cronjob script
Setting permission on raddb files

Installation complete!
```

When the upgrade procedure is finished You have to see **no error** messages displayed. Now You can begin to configure the system.

Manual update

In manual update mode You have to check / reinstall / reconfigure the following components:

1. Install **ionCube** runtime if not yet installed
2. Install the new version of **FreeRadius** if not yet installed
3. Install the new Radius Manager **executables**
4. **Optimize MySQL** server (*my.cnf*)
5. Upgrade RADIUS **databases** to the current version
6. Install new Radius Manager **WEB files**
7. Configure **cron**

Installing ionCube runtime

It is required to install ionCube runtime system if it is not installed on your host. Find the ionCube installation procedure in “Installation procedure of ionCube runtime system” chapter of this manual.

Updating FreeRadius server

It is required to install FreeRadius 2.1.8 DMA Softlab mod 3 to use this release of Radius Manager. Find the FreeRadius installation procedure in “Installation procedure of FreeRadius” chapter of this manual.

Updating Radius Manager executables

Install the new **rmauth**, **rmacnt**, **rmpoller**, **rmconntrack** and **rootexec** executables. Follow points 1–12 from chapter “Manual installation”. You have to **stop rmpoller** and **rmconntrack** daemons before You can overwrite them with new versions. Issue the following commands (Redhat):

```
[root@localhost]# service rmpoller stop
[root@localhost]# service rmconntrack stop
```

On other systems use the following method (it can also be used on Redhat). Be sure to enter the proper PID for **kill** command.

```
[root@localhost]# ps ax | grep rm
10205 ?        Ssl    0:25 /usr/local/bin/rmpoller
15917 ?        Ssl    5:08 /usr/local/bin/rmconntrack
[root@localhost]# kill 10205
[root@localhost]# kill 15917
```

Radius Manager v 4.0.0 and later versions use InnoDB tables instead of MyISAM. InnoDB is faster and uses row level locking mechanism instead of table level locking. Radius Manager is more responsive with InnoDB.

Optimizing MySQL

Before beginning the upgrade it is important to **optimize MySQL server**.

Add the following entries (or edit if they already exist) to *[mysqld]* section in */etc/my.cnf* file:

```
innodb_buffer_pool_size=512M
innodb_log_file_size=128M
innodb_flush_log_at_trx_commit=2
innodb_file_per_table
innodb_flush_method=O_DIRECT
```

Set **innodb_buffer_pool_size = 75%** of RAM size and **innodb_log_file_size = 25%** of innodb_buffer_pool_size.

Delete the files **ib_logfile0** and **ib_logfile1** in */var/lib/mysql* directory and **restart** MySQL server.

Without this optimization the upgrade procedure can last several hours and the overall system performance will be poor.

Upgrading SQL tables

To upgrade from an older Radius Manager version to the latest You have to execute **all SQL** upgrade scripts in **correct order** for both RADIUS and CONNTRACK databases. For example if You are upgrading Radius Manager from 3.2.1 to 4.0.0 You have to execute the SQL scripts in the following order (RADIUS db):

1. upgrade-3.2.1_3.2.2.sql
2. upgrade-3.2.2_3.3.0.sql
3. upgrade-3.3.0_3.4.0.sql
4. upgrade-3.4.0_3.4.1.sql
5. upgrade-3.4.1_3.5.0.sql
6. upgrade-3.5.0_3.6.0.sql
7. upgrade-3.6.0_3.6.1.sql
8. upgrade-3.6.1_3.7.0.sql
9. upgrade-3.7.0_3.8.0.sql
10. upgrade-3.8.0_3.9.0.sql
11. upgrade-3.9.0_4.0.0.sql

To upgrade the CONNTRACK database execute the following scripts in the **correct order**:

1. upgrade_cts-3.2.2_3.3.0.sql
2. upgrade_cts-3.3.0_3.4.0.sql
3. upgrade_cts-3.4.0_3.4.1.sql
4. upgrade_cts-3.4.1_3.5.0.sql
5. upgrade_cts-3.5.0_3.6.0.sql
6. upgrade_cts-3.6.0_3.6.1.sql
7. upgrade_cts-3.6.1_3.7.0.sql
8. upgrade_cts-3.7.0_3.8.0.sql
9. upgrade_cts-3.8.0_3.9.0.sql
10. upgrade_cts-3.9.0_4.0.0.sql

Please note the first CONNTRACK updater SQL script is available in Radius Manager 3.2.2 (the CTS system was introduced in this version).

Check and update the service settings using the ACP after the system has been upgraded.

Installing new PHP files

Copy the new radiusmanager WEB directory, overwriting the old files. Be sure to back up the old configuration files before overwriting them. When done, review and modify the new configuration files in config directory. These files are changing from version to version, so You have to edit them every time after You have updated the system. **Do not** try to use the **old version** configuration files!

Copy the **radiusmanager** cron file to */etc/cron.d* and set the correct permission on it:

```
[root@localhost]# chmod 644 /etc/cron.d/radiusmanager
```

Set the **permissions** and **ownership** on all **PHP files** as described in the manual installation chapter.

Cron

Radius Manager 4 and newer versions have a **own crontab** file, so it is neccessary to **remove rmscheduler** from */etc/crontab*. Open /etc/crontab with any text editor and remove the *rmscheduler* line from it.

Copy **radiusmanager** cron file from *etc/cron* (Radius Manager installation archive) to */etc/cron* directory on your Linux host. Do not miss this step!

WARNING

- When upgrading to 3.0.0 the **invoice sum** and **payout** data are **lost** due to the new data storage method.
- **Back up** the complete **database** before You proceed the upgrade!
- When upgrading to 3.8.0 the old **invoice sums** can be **wrong** due to the new organization of the rm_invoices table. If You have not printed the old invoices yet, do it before upgrading to v 3.8.0.

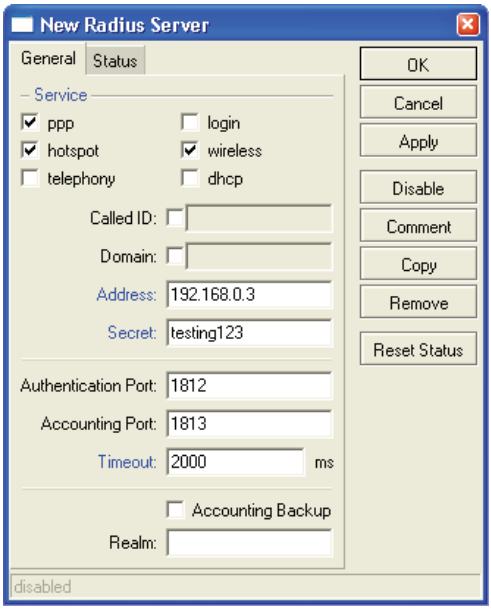
NAS CONFIGURATION

Mikrotik

Setting up RADIUS authentication and accounting

To send authentication and accounting requests to Radius server, You have to configure your Mikrotik NAS. Use Winbox to view and edit the configuration. Follow these steps:

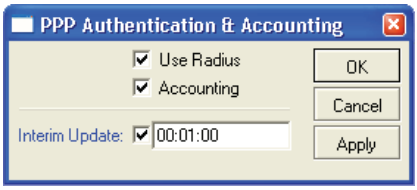
1. **Connect** to your Mikrotik router using Winbox.
2. Select **Radius** from the main menu.
3. Click **+** to define a new **RADIUS** authentication server:



Description of fields:

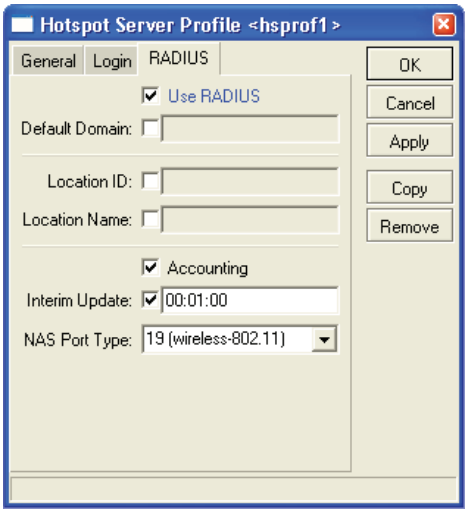
- **Service**:
  - **Hotspot**: enable Hotpsot RADIUS authentication
  - **Wireless**: enable wireless access list RADIUS authentication (turn off Default authenticate for Hotspot wireless interface and turn on RADIUS MAC authentication for the WLAN interface)
  - **PPP**: for PPP RADIUS authentication
  - **Login**: Winbox (telnet, ssh) authentication from RADIUS
  - **Telephony**: telephony authentication from RADIUS
- **Address** is your RADIUS server host.
- **Secret** is the NAS secret from /usr/local/etc/raddb/clients.conf
- **Authentication and Accounting** ports are the standard RADIUS ports.
- **Timeout** defines how much milliseconds can elapse while the answer arrives from the RADIUS server. If You are using slower connection to RADIUS server or the accounting tables are large, set this timeout higher (3000-5000 ms).

4. Set the **AAA options** of **PPP** service (PPtP, L2tP or PPPoE):



Turn on RADIUS authentication (**Use Radius**) and RADIUS accounting (**Accounting**). **Interim update** is the time interval when RADIUS client (Mikrotik NAS) sends the accounting information to the RADIUS server. If You have more than 200 online users, use higher values (5-8 minutes) to avoid MySQL overload.

5. Set the **AAA options** and authentication method of **Hotspot** service:

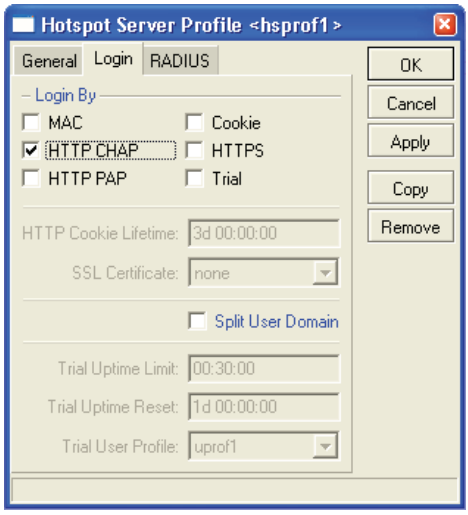


The options are:

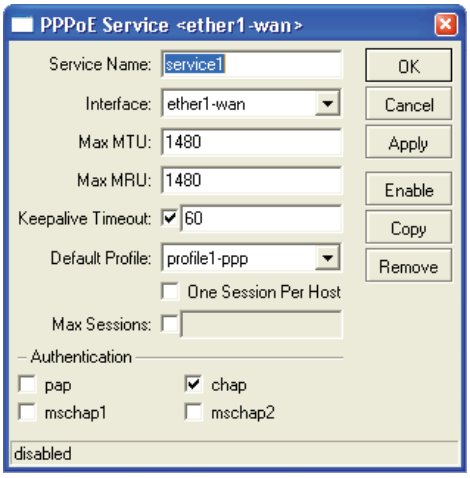
- **Use RADIUS** – this option is used to send access-request packets to RADIUS server.
- **Accounting** – this option is used to send the accounting data to the RADIUS server.
- **Interim update** – defines the interval when the RADIUS accounting data are periodically refreshed. Use a numeric value of 1-5 minutes here. Lower values generate heavy load on MySQL server.

Configure the Hotspot Login options:

- **MAC** –MAC based authentication is used for Hotspot clients.
- **HTTP CHAP** – defines HTTP CHAP authentication method. It uses encrypted packets to send the username / password information from NAS to RADIUS server. Always use CHAP if your CPE devices support it.
- **HTTP PAP** – defines HTTP PAP authentication method; it is a non-encrypted method to send the username / password from NAS to RADIUS server.
- **Cookie** – Hotspot login page will remember the username / password entered.
- **HTTP cookie lifetime** – Defines how many days to remember the username / password.



6. Set the **AAA options** and authentication method of **PPPoE service**:

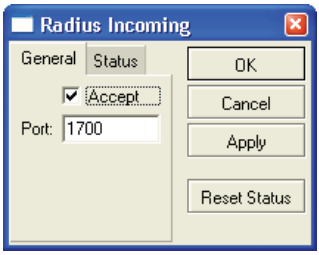


You have to define the following data:

- **Service name –** it is a reference for PPPoE clients.
- **Interface** – The name of the **interface** where PPPoE server is listening.
- The max **MTU** and **MRU** values (use the default values or a bit smaller, for example 1480).
- **PAP** or **CHAP** authentication method (don't use MSCHAP1 or MSCHAP2).
- **Default profile** – Create a new profile and select it from this list.
- **Keepalive timeout** – Define 30-60 seconds here.

7. Enable **incoming RADIUS** requests (POD packets). It is required to use the REMOTE disconnection method in Radius Manager:

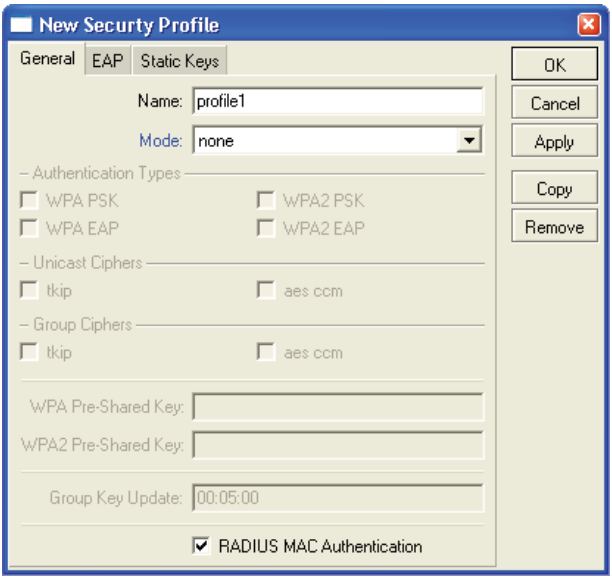
Don't forget to open the UDP port 1700 in firewall on Mikrotik and Linux server.



RADIUS Access List support (RADIUS ACL)

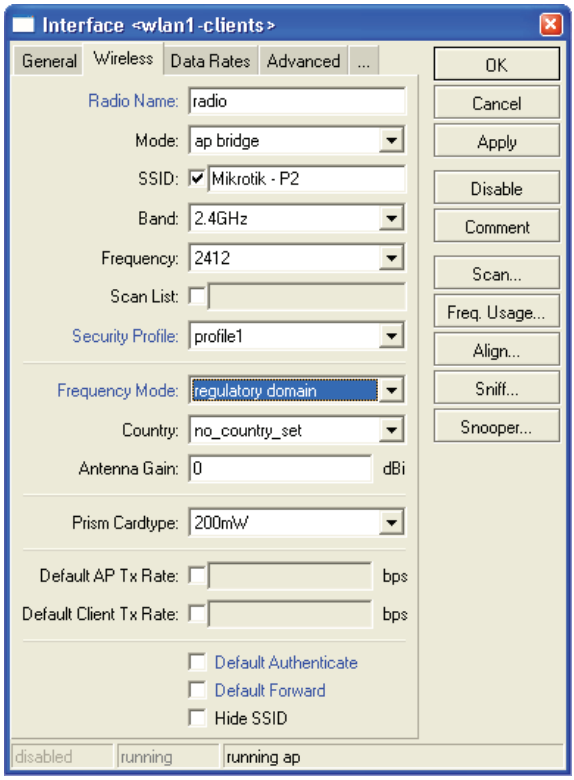
By default, all wireless clients can connect to your Mikrotik AP. If You want to filter them and allow only registered clients to connect to your SSID, You have enable RADIUS MAC authentication in Mikrotik AP.

1. Create a **security profile** using Winbox:



Set the checkbox for RADIUS MAC Authentication.

2. **Assign** the security profile to the wireless interface:



In this case when a client tries to connect to the SSID, Mikrotik authenticates the client's MAC address using the RADIUS server. If the MAC can be found in the database, Mikrotik allows the connection.

If You are planning to use Instant Access Services (IAS), install the customized **login.html** file which can be found in Radius Manager tar archive in *www/mikrotik* folder.

Chillispot

Radius Manager supports various Chillispot systems:

1. Chillispot 1.1.0 running on **Linux**. It is freely available on various websites and it is also downloadable from www.dmasoftlab.com.
2. Chillispot hotspot server running on **DD-WRT** router.
3. Chillispot running on **other** routers .

Please note Radius Manager requires properly configured Chillispot server. You have to configure the radiuslisten and coaport directives in order to use the Chillispot hotspot server with Radius Manager.

Chillispot on Linux

You can build Chillispot from sources easily. To successfully install and configure Chillispot on your Linux host, You need the following hardware and software components:

- Linux host
- Two Ethernet interfaces (one for backbone and one for Hotspot clients)
- C/C++ development system

1. **Download** the Chillispot source archive on your host and **decompress** it:

```
[root@localhost]# gzip -d chillispot-1.1.0.tar.gz
[root@localhost]# tar xvf chillispot-1.1.0.tar
```

2. Enter Chillispot folder and create the **Makefile**:

```
[root@localhost]# cd chillispot-1.1.0
[root@localhost]# ./configure
```

3. Build it with **make** command and install with **make install**:

```
[root@localhost]# make
[root@localhost]# make install
```

4. **Copy** the file *doc/chilli.conf* to */etc*.

Now You can test the Chillispot executable issuing the command:

```
[root@localhost]# chilli
```

If You get errors like

“chillispot[8792]: chilli.c: 917: radiussecret must be specified”

it is completely normal. You have to edit /etc/chilli.conf before begin to use it.

5. Uncomment **debug flags** in line 9:

```
fg
```

Uncommenting this line, You ensure to run Chillispot in foreground mode. It is good for debugging purposes. When the system is fully working, You will comment out this line again.

6. Define the **DNS** server IP address in line 59:

```
dns1 192.168.0.3
```

It must be a reachable DNS server, otherwise You will be unable to log on to Chillispot, instead it will wait a long time for the DNS response. Install and configure a DNS server on your Linux host and define the Linux IP as the DNS server address.

7. Define **RADIUS server** addresses in line 113 and 120:

```
radiusserver1 192.168.0.3
radiusserver2 192.168.0.3
```

It is the address where FreeRadius is running. Use only one server at same time. Define the same IP in both lines.

You can install FreeRadius, Radius Manager and Chillispot on a same host, but multiple host installation is also realizable.

8. Uncomment and define the **RADIUS secret** in line 139:

```
radiussecret testing123
```

The secret must match the one which is defined in ACP NAS definition. Don’t forget, You have to restart FreeRadius server every time after modifying the NAS definitions in *raddb/clients.conf*. Unfortunately, FreeRadius doesn’t read the NAS database at run-time.

9. Define RADIUS **NAS IP** in line 149. It is important to send the NAS IP in every RADIUS request for NAS identification.

```
radiusnasip 192.168.0.3
```

10. Define **UAM** server in line 237:

```
uamserver https://192.168.182.1/cgi-bin/hotspotlogin.cgi
```

The default gateway address is 192.168.182.2 for Chillispot, so don't change it. A working, HTTPS capable web server is required to serve the CGI versions of Chillispot login page.

11. **Uncomment** line 248 and define the UAM secret:

```
uamsecret secret
```

This secret must match the defined one in *hotspotlogin.cgi*.

11. **Copy** the *hotspotlogin.cgi* to HTTP server's *cgi-bin* folder. On Fedora it is */var/www/cgi-bin*. The file *hotspotlogin.cgi* must be executable, so modify the **permission** using *chmod*:

```
[root@localhost]# chmod 755 /var/www/cgi-bin/hotspotlogin.cgi
```

Completing this step You have finished configuring Chillispot. Now You have to set up a dedicated Ethernet interface in your Linux host for Hotspot users. As it was defined before, You need at least two network interface cards (NIC) installed in your host:

1. **WAN** – for connecting to the Internet.
2. **LAN** – for connecting the Chillispot Hotspot clients.

The Hotspot interface (LAN) requires a special setup:

1. Turn off all DHCP servers listening on that interface
2. Do not assign any IP address to it

The correct ifcfg-xxx file looks like this:

```
DEVICE=eth1
ONBOOT=yes
BOOTPROTO=static
#IPADDR=192.168.182.1
#NETMASK=255.255.255.0
HWADDR=00:30:4F:03:DF:93
```

In this example we have commented out the IP address and netmask definitions of interface eth1. Create a similar ifcfg-xxx file on your system. After that restart the network on the Linux host.

When You Issue the command *ifconfig*, You have to see similar output to this:

```
eth1   Link encap:Ethernet  HWaddr 00:30:4F:03:DF:93
       UP BROADCAST MULTICAST  MTU:1500  Metric:1
       RX packets:0 errors:0 dropped:0 overruns:0 frame:0
       TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
       collisions:0 txqueuelen:1000
       RX bytes:0 (0.0 b)  TX bytes:0 (0.0 b)
       Interrupt:10 Base address:0x2000
```

If the output is correct, You can start using Chillispot. Start it with the following parameters:

```
[root@localhost]# chilli --coaport 3779
```

The parameter *--coaport* defines the port for the incoming disconnect requests (POD). Use value 3779 for your Chillispot server.

After Chillispot has been started, the connected machines have to get IP address from Chillispot server. You have to see the IP requests on the debug screen.

When You enter any address in the browser and the DNS server is working properly, You have to see the Chillispot login page within 2-3 seconds.

To ensure IP packets are forwarded properly to Chillispot interface, You have to enable the IP packet forwarding in Linux. You can do this with the following command:

```
[root@localhost]# echo "1" > /proc/sys/net/ipv4/ip_forward
```

Also, masquerade the local Hotspot addresses:

```
[root@localhost]# iptables -t nat -A POSTROUTING -s 192.168.182.0/255.255.255.0 -j
MASQUERADE
```

Be sure You enter the line above without line breaks. In this example the Hotspot address range is **192.168.182.0/24**.

Now configure Radius Manager, define NASs (raddb/clients.conf, ACP) and begin using your newly installed Chillispot Hotspot system.

DD-WRT

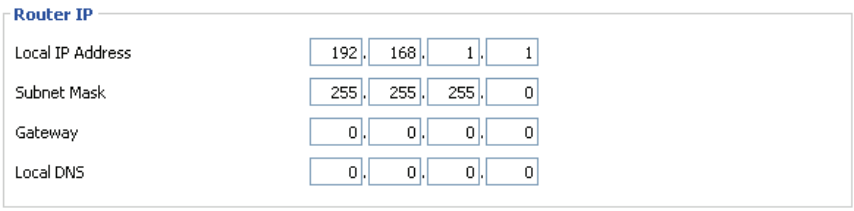
Beginning from Radius Manager v 3.9, various DD-WRT routers are also supported. The following setup instructions are for DD-WRT v23 SP3, but You can use it for configuring different DD-WRT versions (consult your DD-WRT manual first).

As a first step You have to configure the network interfaces on DD-WRT router:

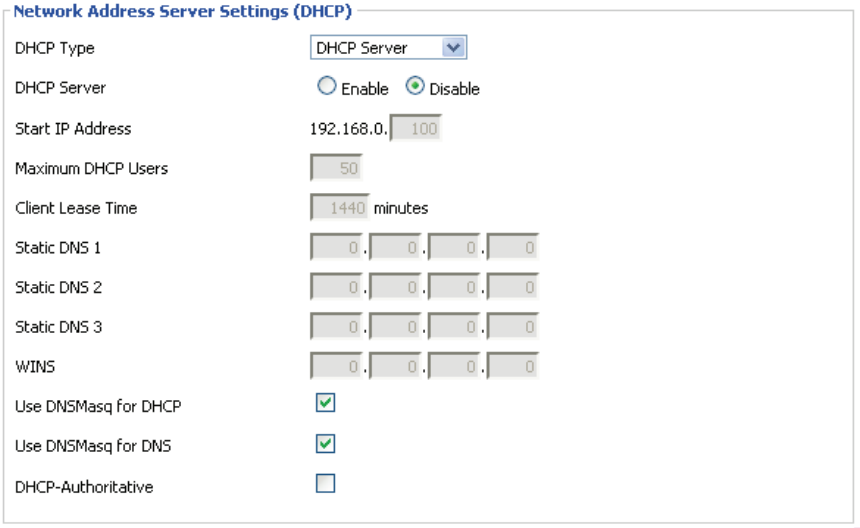
1. **WAN** – Internet side.
2. **LAN & WLAN** – Client side.

WAN is used to connect the router to the Internet. Several connection modes are available. In this example we use Static IP mode with address 192.168.0.50. You can also configure PPP and DHCP modes for the WAN connection. Set the IP address, netmask, DNS and gateway of the WAN interface.

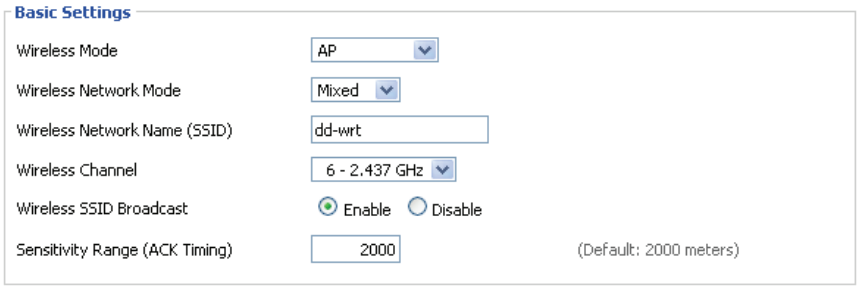
Set any IP address for your LAN adapter:



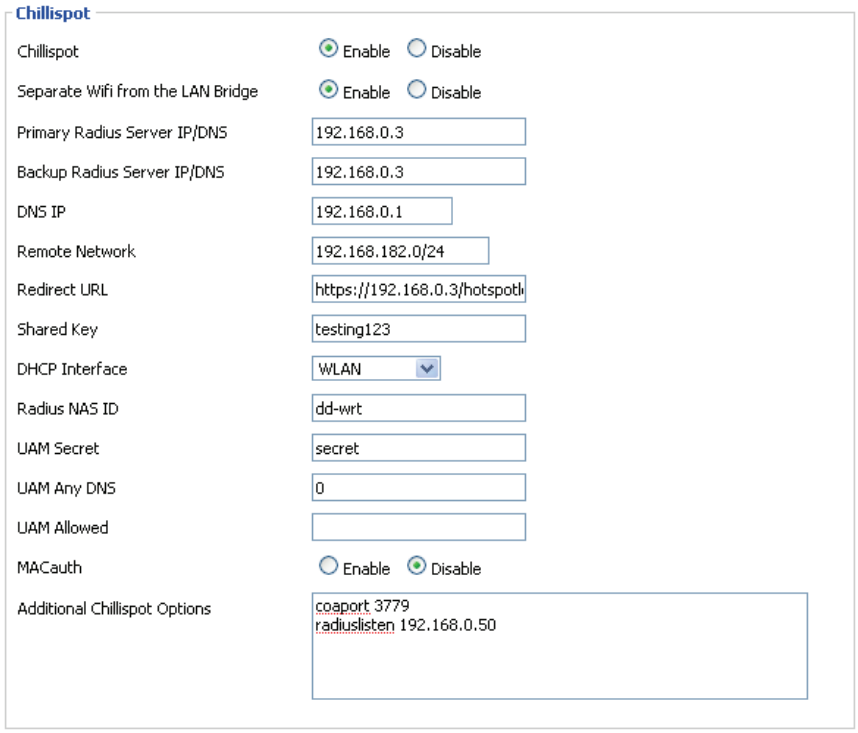
Disable the DHCP server on LAN. Chillispot itself is a DHCP server. If You enable the 2nd DHCP server on the same interface they can conflict.



Activate the WLAN interface, enable AP mode, set the SSID and channel.



Now enable the Chillispot service and configure it as it is shown on the picture. Define the following data:



- **Chillispot** – Enable it to activate the Chillispot service.
- **Separate Wifi from the LAN bridge** – Select this if You want to enable the Hotspot server on the WLAN interface.
- **Primary and secondary RADIUS servers** – Define the Radius Manager server IP in both fields.
- DNS IP – Define a valid DNS server IP (usually it is your gateway router's LAN address)
- **Remote network** – Defines the Hotspot client's network. Set it to 192.168.182.0/24.
- **Redirect URL** – defines the Hotspot login page, server by the Linux server. DD-WRT has no own login page, so a remote host must serve it. Be sure to begin this line with **https://** or **http://**. In our example the complete URL is https://192.168.0.3/hotspotlogin.php. You can find a working *hotspotlogin.php* file in Radius Manager installation archive. Install it on your HTTP server.

- **Shared key** – The shared RADIUS key, defined in Radius Manager NAS setup form.
- **DHCP interface** – Select the interface to connect the Hotspot clients to. We want to set up a Wireless Hotspot server, so select **WLAN**. You can also select LAN & WLAN here if You want to connect the clients using Ethernet cable. WAN interface cannot be selected; it is used to connect the router to the Internet.
- **RADIUS NAS ID** – Define it freely to identify your DD-WRT router in RADIUS requests.
- **UAM secret** – This entry must match the secret key defined in *hotspotlogin.php or hotspotlogin.cgi*. The default is "**secret**".
- **UAM any NAS** – Leave it blank.
- **UAM allowed** – Leave it blank.
- **MAC auth**. – Disabled. Currently unsupported.
- **Additional Chillispot options** – Be sure to define the **coaport** and **radiuslisten** directives here.

Coaport is required to accept POD packets (remote disconnection), while **radiuslisten** is necessary to send the correct NAS IP address in RADIUS requests. Set radiuslisten to NAS IP address (in this example it is 192.168.0.50 – the Internet address of the DD-WRT device).

After You save and apply the configuration, DD-WRT will generate the Chillispot configuration file and tries to start the Chilli service. If the Hotspot system is not working, You can debug it using telnet or SSH. Check the Chilli service (is it running?) and the configuration file. If the configuration entries are invalid, Chilli service is not started and no error is reported by the WEB GUI.

In telnet session You have to see the following (if Chilli service is running):

```
~ # ps | grep chilli
 4124 root      4840 S   /usr/sbin/chilli -c /tmp/chilli.conf
```

The generated configuration file is located in /tmp folder in this example.

Notes

Chillispot doesn't support IP address based POD packets, only user names are supported. If You have more than one online session of a specific user, You cannot disconnect the user remotely properly. Always set simultaneous-use = 1 for Chillispot accounts in ACP / Edit users form if You want to use the remote disconnection method.

Cisco

Radius Manager supports the following features on Cisco NAS:

1. **Authentication** and **authorization** of PPP users (PPPoE, PPPtP, L2tP).
2. **Bandwidth** limitation per user (upload and download).
3. Automatic **disconnection** of expired accounts.
4. Limit **simultaneous** connections.
5. **Static IP** addresses.

Prerequisites are to have the correct IOS version in your Cisco NAS which can handle AAA new model and PPPoE, PPtP connections (vpdn-group or bba-group).

In this chapter we describe the RADIUS specific Cisco configuration entries. To enable AAA feature on Cisco, define the following entries using the configuration mode:

```
aaa new-model
aaa authentication ppp default group radius
aaa authorization network default group radius
aaa accounting delay-start
aaa accounting update periodic 1
aaa accounting network default start-stop group radius
aaa pod server auth-type any server-key testing123

virtual-profile aaa
vpdn enable
vpdn-group pppoe
 accept-dialin
  protocol pppoe
  virtual-template 1

interface FastEthernet0/0
 ip address 192.168.0.98 255.255.255.0
 ip nat outside
 duplex auto
 speed auto

interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
 pppoe enable

interface Virtual-Template1
 ip unnumbered FastEthernet0/0
 ip nat inside
 peer default ip address pool pool1
 ppp authentication pap chap ms-chap
 ppp ipcp dns 192.168.0.3
```

```
ip local pool pool1 10.5.7.1 10.5.7.254
ip nat inside source list 1 interface Virtual-Template1 overload
access-list 1 permit 10.5.7.0 0.0.0.255

radius-server host 192.168.0.3 auth-port 1812 acct-port 1813
radius-server key testing123
```

The described configuration controls the AAA features on Cisco NAS. You have to set up the proper IP pools for local or public addresses, define NATing of local addresses etc. In the example above we are using DNS server address 192.168.0.3 and RADIUS server address 192.168.0.3. Substitute them with your own hosts. Also define the proper Ethernet interface names.

If You are using PPPoE connections, set up the correct interface to listen to PPPoE calls (pppoe enable).

This sample setup enables PPPoE server on FastEthernet0/1, enables POD packets and defines 1 minute interim update interval. The IP addresses assigned to PPPoE clients are defined in *pool1*. NATing is also enabled for the local IP addresses.

On Cisco, Radius Manager supports two types of bandwidth limitation:

1. rate-limit
2. policy-map

You can use the following commands on Cisco to check the actual bandwidth limitations of connected users:

show interfaces rate-limit
show policy-map interface
show policy-map session

Example of **show interfaces rate-limit** command:

```
Cisco2611#show interfaces rate-limit
Virtual-Access4
  Input
    matches: all traffic
      params:  128000 bps, 24576 limit, 49152 extended limit
      conformed 2 packets, 432 bytes; action: transmit
      exceeded 0 packets, 0 bytes; action: drop
      last packet: 369ms ago, current burst: 0 bytes
      last cleared 00:00:00 ago, conformed 6000 bps, exceeded 0 bps
  Output
    matches: all traffic
      params:  520000 bps, 98304 limit, 196608 extended limit
      conformed 0 packets, 0 bytes; action: transmit
      exceeded 0 packets, 0 bytes; action: drop
      last packet: 217264ms ago, current burst: 0 bytes
      last cleared 00:00:00 ago, conformed 0 bps, exceeded 0 bps
```

Some IOS versions don't support rate-limit method. If the bandwidth limitation isn't working with rate-limit method, define the policy-map on Cisco (both for upload and download) and define the same policy-map names in ACP / Edit service.

An example Cisco **policy-map** looks like this:

```
policy-map POLICY_UP_1024
  class class-default
   police cir 1128000 bc 192000 be 192000
     conform-action transmit
     exceed-action drop

policy-map POLICY_DOWN_1024
  class class-default
   police cir 1128000 bc 256000 be 256000
     conform-action transmit
     exceed-action drop
```

Example of **show policy-map interface** command:

```
Cisco2611#show policy-map interface
Virtual-Access3.2

  Service-policy input: 128

    Class-map: class-default (match-any)
      4 packets, 632 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: any
      police:
          cir 128000 bps, bc 4000 bytes
        conformed 4 packets, 632 bytes; actions:
          transmit
        exceeded 0 packets, 0 bytes; actions:
          drop
        conformed 0 bps, exceed 0 bps

  Service-policy output: 512

    Class-map: class-default (match-any)
      1 packets, 16 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: any
      police:
          cir 512000 bps, bc 16000 bytes
        conformed 0 packets, 0 bytes; actions:
          transmit
        exceeded 0 packets, 0 bytes; actions:
          drop
        conformed 0 bps, exceed 0 bps
```

You can alternatively try **show policy-map session** command:

```
Cisco2611#show policy-map session
```

For more Cisco related informations please consult website: http://www.cisco.com.

StarOS

In current version of Radius Manager there is a limited support for StarOS v2 and v3 systems. The supported services are:

- **PPPoE** full support
- Limited **acccess list** support

Using PPPoE system You can easily build small and medium sizes ISP's. PPPoE is a reliable, industry standard authentication method for broadband connections.

We recommend to use Star v2 server edition. With StarOS, You cannot use more than one simultaneous connections for a specific user, otherwise You cannot disconnect the users properly, because StarOS PPPoE system doesn't support remote disconnect method based on IP address. In StarUtil the only one supported reference is the username. So, always use simultaneous-use = 1 for StarOS clients (it can be defined in ACP / Edit users form).

To use Radius Manager with PPPoE system in StarOS, You have to:

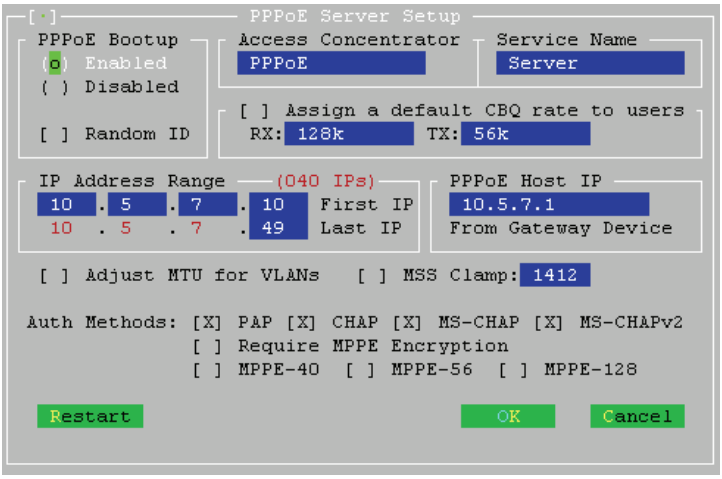
1. Set the specific **interface** to listen to PPPoE request
2. Enable and **configure PPPoE server**
3. **Acivate PPPoE** server at run-time
4. Set up **RADIUS** authentication
5. Configure **firewall**
6. Save and **activate settings**

PPPoE server setup

1. Use option **interfaces / [interface name] / listen to pppoe requests: yes** to configure the interface to act as a PPPoE server interface.

2. PPPoE server configuration dialog can be invoked using the option:

services / pppoe server / bootup/configuration settings



In this example we use PPPoE client pool 10.5.7.10 – 10.5.7.49. These addresses will be assigned to PPPoE clients. The PPPoE server IP is 10.5.7.1.

Select the compatible authentication method with your CPEs. PAP is unencrypted, so the recommended authentication methods are: **CHAP**, **MS-CHAP** and **MS-CHAP v2**. For compatibility You can also enable **PAP**.

3. You can control the PPPoE service activity without rebooting the system using the dialog:

services / pppoe server / service activation

4. Set up RADIUS authentication using the option:

services / pppoe server / radius authentication setup

In this dialog define the following parameters (assuming your RADIUS server's IP address is 192.168.0.3 and using standard RADIUS ports):

- authserver 192.168.0.3:1812
- acctserver 192.168.0.3:1813
- secret 192.168.0.3 testing123

These three parameters are a must have. You can also edit retries, timeout etc.

5. If You are using local addresses for PPPoE clients, You have to masquerade them. Invoke the NAT editor using the option:

advanced / scripts (cbq, firewall, nat, static arp, ...) / nat and static nat (1:1 ip mapping)

6. You can do this adding a new line to NAT / Static NAT table:

```
masq from 10.5.7.0/24 to dev ether1
```

In this example the whole class C **10.5.7.0/24** is masqueraded to the backbone interface **ether1**. Always use the correct backbone interface.

Save the settings and activate the changes.

7. Use option **file / activate changes** to save all your settings and activate PPPoE server on StarOS. Also activate the script changes using option

advanced / scripts (cbq, firewall, nat, static arp, ...) / activate script changes

You have now successfully set up the PPPoE server on StarOS v2. Add the StarOS NAS in Radius Manager ACP, restart FreeRadius in debug mode and begin testing the PPPoE functionality.

Wireless access list setup

Radius Manager has limited compatibility with StarOS access list entries.

Unfortunately, when a wireless client gets connected using RADIUS access list, StarOS doesn't send only access request, but it also sends the accounting information for the access list user. It will not update the accounting information in regular intervals like PPPoE server, so You will see the access list user entry in ACP online users list, but with incorrect accounting data. So pay attention when using this feature.

To enable access list support, use access list editor for the specific interface. Invoke it using option:

wireless / [interface name] / access control list editor

Define the default action for handling wireless clients.

```
default = radius
```

Activate the changes. When a client tries to connect to StarOS WLAN interface, StarOS sends the access-request message to RADIUS server. It must respond with access-accept to allow the client to communicate with StarOS server.

Notes on StarOS compatibility

- Radius Manager is **fully compatible** with StarOS PPPoE server.
- Radius Manager has **limited compatibility** with StarOS access list system.
- Radius Manager is **not compatible** with StarOS Hotspot system. StarOS uses a stripped down version of Chillispot and it sends improper NAS IP address, doesn't accept the remote disconnect messages (POD), it sends accounting data in wrong format (upload and download are exchanged) and doesn't update the accounting data in regular intervals.

If You need a functioning and free Hotspot system, use Chillispot 1.1.0 on Linux. It supports all the features which are missing from StarOS and Radius Manager has full support for it.

PfSense

Radius Manager v 3.8 and newer versions include support for pfSense NAS. pfSense has a built in Chillispot captive portal which is fully controllable with Radius Manager.

The following features are available:

- Authentication
- Accounting
- Bandwidth shaping per individual users
- Download traffic limitation
- Upload traffic limitation
- Combined traffic traffic limitation
- Online time limitation
- Account expiry

Restrictions:

- pfSense **dos not support remote disconnection** using POD packets, instead it is using reauthentication which has drawbacks against the POD system.
- Because pfSense uses reauthentication method to check the validity of the logged on account, at least **sim-use = 2** has to be set for every pfSense user in Radius Manager ACP / Edit user dialog. Sim-use = 1 will result immediately disconnection of the user when the first reauthentication packet is sent to the RADIUS server (RADIUS server thinks the user is already online and doesn't give a permission for a new concurrent connection which causes pfSense to close the active session of the current user).

This installation manual is not a complete pfSense user's manual. It covers the most important and RADIUS specific configuration steps only. For more pfSense informations visit their official web site: http://www.pfsense.com

To configure pfSense as captive portal You have to complete the following steps:

- Configure **interfaces** (WAN and LAN)
- Configure **DNS**
- Configure DHCP server
- Configure captive portal

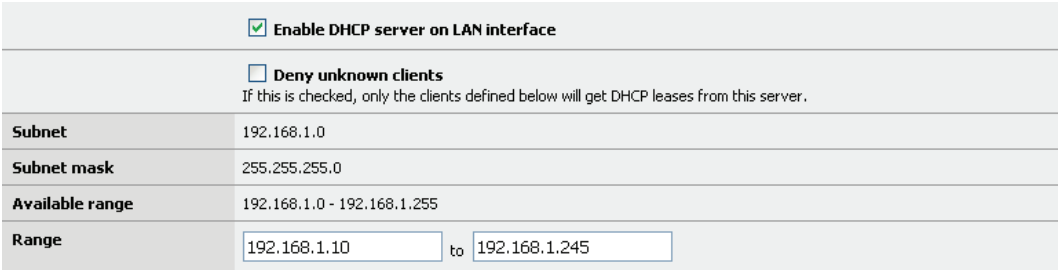
Configuring the network interfaces and DNS

Use the configuration console set the following parameters of the pfSense router:

1. **WAN address –** Use static address, Radius Manager can communicate with the NAS if it is using static IP address.
2. **LAN address –** It is the gateway of your Hotspot clients. In our example it is 192.168.1.1 with subnet /24.
3. **Default gateway** – Set the correct gateway to reach the world.
4. A valid **DNS server** address – Set it using the web configurator or the configuration console.

Configuring the DHCP server

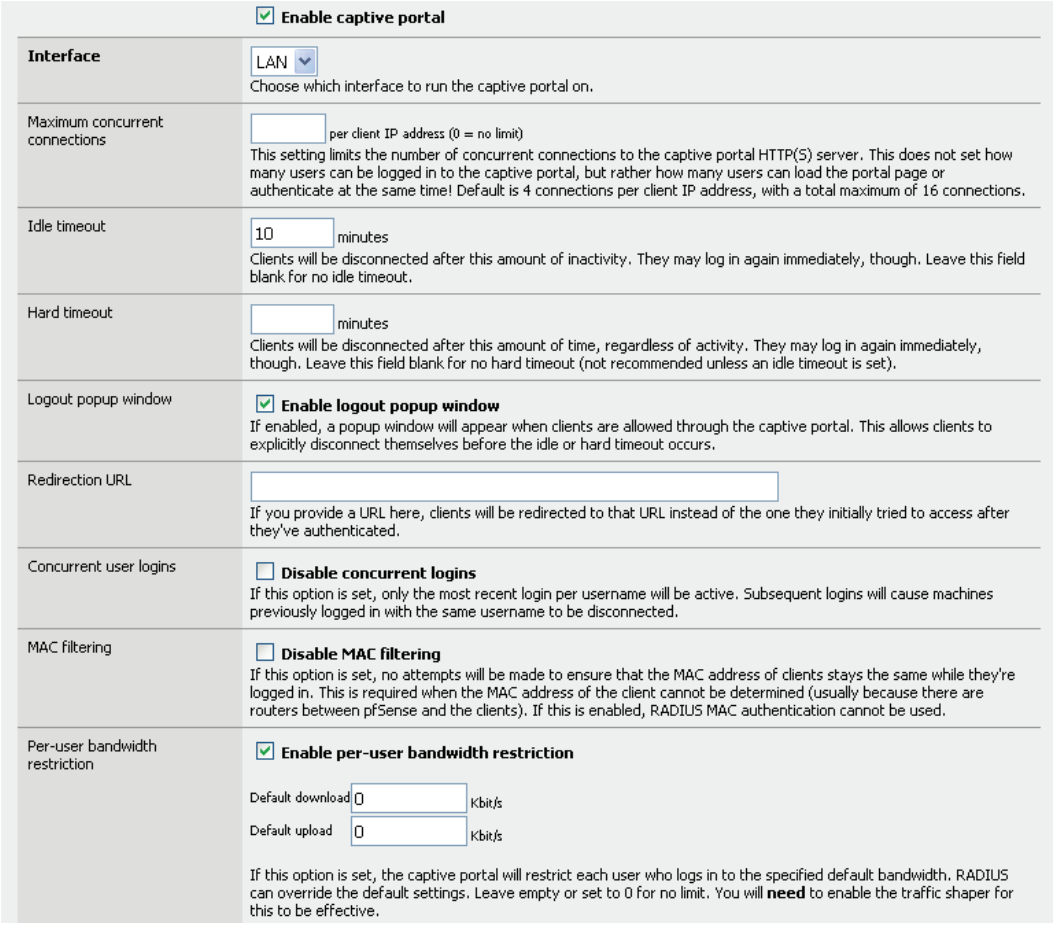
Open the dialog in WEB configurator using the menu Services / DHCP server. Enter the valid network range and enable the DHCP server on the LAN interface as it is shown on the picture below. Be sure the LAN IP address is located in the same subnet.



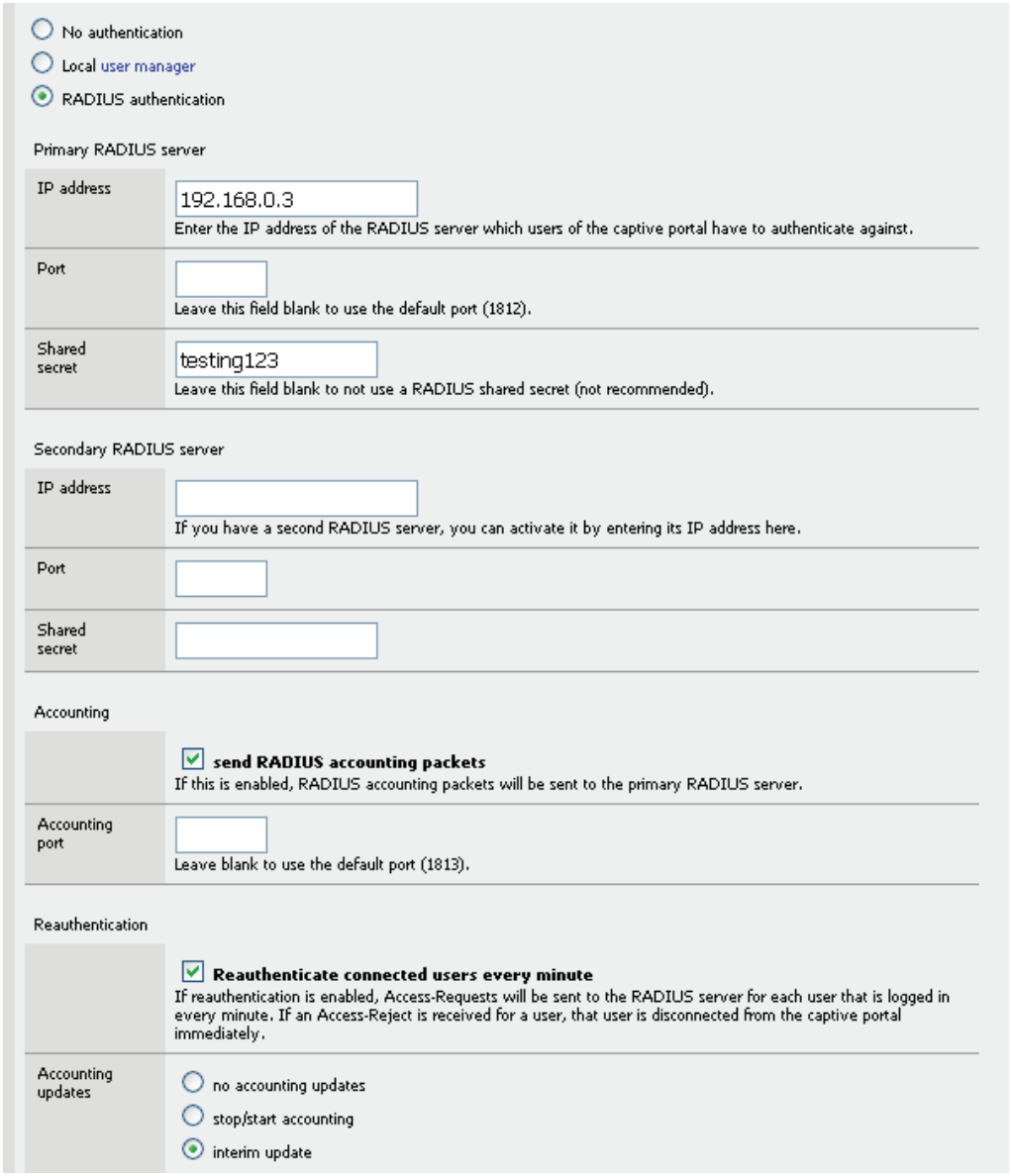
Configuring the captive portal

Follow these simple steps to enable and configure the captive portal with RADIUS support:

1. Open the **Captive portal options** (Services / Captive portal)



2. **Enable** the captive portal with checkbox
3. Select the **interface** where You will connect the Hotspot clients
4. Set **idle timeout** to 10 minutes
5. Enable logout **popup window** with checkbox
6. Enable per-user **bandwidth** restriction
7. Select **RADIUS** authentication
8. Enter the primary **RADIUS server** IP address
9. Enter the shared secret
10. Turn on checkbox “send RADIUS accounting packets”
11. Turn on checkbox “Reauthenticate connected users every minute”
12. Select accounting updates “**interim update**”



CTS SETUP

Radius Manager has a special feature: the Connection Tracking System. It is available only in Radius Manager CTS version or higher. With the help of it the system can track and log all the TCP and UDP connections for all registered (online) users.

By default when You install the CTS enabled version of Radius Manager, it will use the default CTS database (CONNTRACK). It is strongly recommended to use a separate database host for the CONNTRACK database, due to the enormous amount of data stored daily. It can be even a 100-500 MegaBytes / day. Fast disks are also recommended to be able to seek and store the data in real time. Radius Manager periodically stores the traffic data to CONNTRACK database (typically in every 5–60 seconds).

To use the CTS feature You need a Mikrotik router. It can be:

1. The same router where the PPP and Hotspot users are connected to or
2. A separate router which passes traffic through on it (backbone router)

If You use the second option, You can't masquerade the clients on PPP / Hotspot server and cannot use transparent proxy on it. You must ensure the packets are going through the traffic logger Mikrotik with their original IP addresses. Masquerading can be done after the packets were processed by the CTS logger router.

When the packets are going through the logger router, the router processes them using a firewall rule and sends the log data to the Radius Manager CTS host.

The following configuration has to be set up on the logger Mikrotik router:

1. Add the following firewall rule to the filter table:

```
/ip firewall filter add chain=forward src-address=10.5.7.0/24 protocol=tcp \ connection-
state=new action=log


/ip firewall filter add chain=forward src-address=10.5.7.0/24 protocol=udp \ connection-
state=new action=log
```

It will log all UDP and TCP packets going through the logger router.

2. Enable remote logging for firewall events:

```
/system logging action add name=remote1 remote=192.168.0.3:4950 target=remote

/system logging add topics=firewall action=remote1
```

Test the logging system by executing the **rmconntrack** binary on Linux in debug mode:

```
[root@localhost]# rmconntrack –x
rmconntrack daemon started successfully.
```

When online user's UDP or TCP traffic is going through the logger Mikrotik, You have to see the logging data arriving to Linux.

DOCSIS SETUP

This chapter decribes the required steps to configure a DOCSIS DHCP server controlled by Radius Manager. Skip this chapter if You have no Radius Manager DOCSIS license.

The manual describes Radius Manager DOCSIS installation details for Fedora Core 8-14 and CentOS 5-6.

1. First at all install the required packages:

```
[root@localhost]# yum install tftp-server
```

2. Edit **/etc/xinet.d/tftp** and set **disable = no** and enter the correct **path** of the tftp boot files:

```
service tftp
{
        socket_type  = dgram
        protocol     = udp
        wait         = yes
        user         = root
        server       = /usr/sbin/in.tftpd
        server_args  = -s /var/www/html/radiusmanager/tftpboot
        disable      = no
        per_source   = 11
        cps          = 100 2
        flags        = IPv4
}
```

Restart xinetd to actualize the changes**:**

```
[root@localhost]# service xinetd restart
```

3. Select the dhcp server configuration template (**dhcpd.conf-bridge** or **dhcpd.conf-route**) which fits your system (route or bridge mode CMTS) and **rename** it to **dhcpd.conf**. The files are located in */var/www/html/radiusmanager/config* directory.

4. Set the correct **owner** of **dhcpd.conf**:

```
[root@localhost]# chown apache /var/www/html/radiusmanager/config/dhcpd.conf
```

5. Create a **symbolic link** in /*etc* to **dhcp.conf**:

```
[root@localhost]# ln -s /var/www/html/radiusmanager/config/dhcpd.conf /etc/dhcpd.conf
```

6. **Delete** the **dhcp server** package if already installed:

```
[root@localhost]# rpm -e dhcp
```

7. Install **dhcpd v 3** in */usr/local/sbin* directory. The file is available from:

http://dmasoftlab.com/cont/downloads

Please note only this version works properly. Do not try to use different DHCP server versions.

Set **755** permission on **dhcpd** binary file to make it executable:

```
[root@localhost]# chmod 755 /usr/local/sbin/dhcpd
```

8. Install the **dhcp** SYS V **init script** in */etc/init.d* and set the correct permissions. The file is included in Radius Manager installation archive (*rc.d/redhat/dhcpd*).

```
[root@localhost]# chmod 755 /etc/init.d/dhcpd
```

Enable startup at boot time:

```
[root@localhost]# chkconfig --add dhcpd
```

9. **Start dhcp** server as service (for testing it):

```
[root@localhost]# service dhcpd restart
Shutting down dhcpd:                [FAILED]
Starting dhcpd:                     [  OK  ]
```

It will create the directory for the lease file (/var/state/dhcp/dhcpd.leases).

10. **Install packages** required by the docsis utility:

```
[root@localhost]# yum install bison net-snmp-devel flex
```

11. Build the **docsis utility**. The sources are available from:

http://dmasoftlab.com/cont/downloads

```
[root@localhost]# ./configure
[root@localhost]# make
[root@localhost]# make install
```

Test it from shell:

```
[root@localhost]# docsis
DOCSIS Configuration File creator, version 0.9.6
Copyright (c) 1999,2000,2001 Cornel Ciocirlan, ctrl@users.sourceforge.net
Copyright (c) 2002,2003,2004,2005 Evvolve Media SRL, docsis@evvolve.com
```

It should display the usage information.

DHCP server configuration file

The following DOCSIS setups are possible:

- **Route mode** CMTS (Motorola BSR series, Cisco UBR series etc.)
- **Bridge mode** CMTS (Arris etc.)

This manual doesn't cover the configuration steps of CMTS. You can find it in the manual shipped with your CMTS.

For both CMTS types configure the common parameters in **dhcpd.conf** file. It is located in */var/www/html/radiusmanager/config* directory (You can also access it in **/etc/dhcpd.conf**).

```
authoritative;
option domain-name "localdomain";
option domain-name-servers 8.8.8.8;
option time-servers 192.53.103.108;
ddns-update-style none;
min-lease-time 3600;
default-lease-time 3600;
max-lease-time 3600;
log-facility local6;
```

3600 seconds lease time (1 hour) is required to allow disconnecting the expired cable modems. Be sure to set the correct **DNS** and **NTP** server addresses. **DNS** is **essential** while without a valid NTP server the system can work (but the modems will report error).

Route mode setup

The following segment is required by **route mode** CMTS. Define the listening interface:

```
# interface eth0
subnet 192.168.0.0 netmask 255.255.255.0 {
}
```

Define the **CM IP pool**. The CM gateway is located on the cable interface of the CMTS (10.0.0.1 in this example):

```
# cm
subnet 10.0.0.0 netmask 255.255.0.0 {
   option routers 10.0.0.1;
}
```

Define the **CPE IP pool**. The CPE gateway is located on the cable interface of the CMTS (10.15.0.1 in this example):

```
# cpe
shared-network cpe {
   subnet 10.15.0.0 netmask 255.255.255.0 {
      option routers 10.15.0.1;
      range dynamic-bootp 10.15.0.2 10.15.0.254;
   }
}
```

Bridge mode setup

The following segment is required by **bridge mode** CMTS. Define a class for differentiating the CM and CPE requests:

```
class “cm” {
#    match if (
#           (binary-to-ascii(16, 8, “:”, substring(hardware, 1, 3)) = “0:13:71”) or
#           (binary-to-ascii(16, 8, “:”, substring(hardware, 1, 3)) = “0:13:72”)
#    );

   match if substring(option vendor-class-identifier,0,6) = “docsis”;

#    log(info, option vendor-class-identifier );
#    log(info, binary-to-ascii(16, 8, “:”, substring(hardware, 1, 6)) );
}
```

In most cases the **vendor-class-identifier** string is enough to set. For special cases if the system is unable to recognize the CM requests using the **vendor-class-identifier** string, use the MAC address matching mechanism. For this comment out the “*match if substring”* line and ucomment the commented out blocks.

Define the **CM** and **CPE IP pools**:

```
shared-network cm-cpe {
   subnet 192.168.0.0 netmask 255.255.255.0 {
   }

   subnet 10.0.0.0 netmask 255.255.0.0 {
      option routers 10.0.0.1;
   }

   subnet 10.15.0.0 netmask 255.255.255.0 {
      option routers 10.15.0.1;
      pool {
         deny members of “cm”;
         range dynamic-bootp 10.15.0.2 10.15.0.254;
      }
   }
}
```

In this example the listening interface has IP address 192.168.0.x, the CM IP pool is 10.0.0.0/16 and the CPE IP pool is 10.15.0.0/16.

The **gateways** (CM and CPE) are configured **on the router**. Don’t forget, in this setup the CMTS is a pure bridge device, it doesn’t do any routing. It has only one IP address (or no one if You configure it via a serial console).

Testing

Now You can try to run **dhcpd** in debug mode to see the incoming DHCP requests:

```
[root@localhost]# dhcpd -d
Internet Software Consortium DHCP Server V3.0
Copyright 1995-2001 Internet Software Consortium.
All rights reserved.
For info, please visit http://www.isc.org/products/DHCP
Wrote 0 leases to leases file.
Listening on LPF/eth0/00:00:e8:ec:8a:e8/192.168.0.0/24
Sending on   LPF/eth0/00:00:e8:ec:8a:e8/192.168.0.0/24
Sending on   Socket/fallback/fallback-net
```

It should report no errors. The DHCP server is ready to serve CM and CPE requests.

ADDITIONAL SETUP

Log files

FreeRadius log file sometimes became enormously big (10-30 MBs), and the Linux file system is unable to handle it fast enough which is required for a flawless work of FreeRadius server. It can cause degraded system performance and / or RADIUS timeouts. To prevent such problems, the log file has to be stripped regularly.

To set up automatic log rotation for radiusd.log, simply copy the file etc/logrotate/radiusd from radiusmanager tar archive to /etc/logrotate.d folder on your Linux host. The automatic installer also does the same job. The included logrotate script is Redhat and Debian compatible. It can also be used on other systems with minor modifications.

Starting Radius Manager daemons at boot time

Radius Manager system supports automatic startup of daemons: *radiusd*, *rmpoller* and *rmconntrack*. The automatic installer copies all the required scripts to */etc/init.d* directory, sets the required permissions and enables automatic startup of *radiusd*, *rmpoller* and *rmconntrack* daemons.

If You have installed the system using manual installation method, copy *rmpoller*, *rmconntrack* and *[debian]/radiusd* or *[redhat]/radiusd* files to */etc/init.d* directory from Radius Manager installation archive.

Set the **permissions** to **755** on all scripts:

```
[root@localhost]# chmod 755 /etc/init.d/radiusd
[root@localhost]# chmod 755 /etc/init.d/rmpoller
[root@localhost]# chmod 755 /etc/init.d/rmconntrack
```

The following methods are available to set up automatic service startup:

- Use **Webmin** to start services at boot time or
- Create **symbolic links** manually
- Use **chkconfig** command (Fedora, CentOS)
- Use **update-rc.d** command (Debian, Ubuntu)

On Fedora, CentOS issue the following commands:

```
[root@localhost]# chkconfig --add radiusd
[root@localhost]# chkconfig --add rmpoller
[root@localhost]# chkconfig --add rmconntrack
```

On Debian and Ubuntu the commands are:

```
[root@localhost]# update-rc.d rmpoller defaults 99
[root@localhost]# update-rc.d rmconntrack defaults 99
[root@localhost]# update-rc.d radiusd defaults 99
```

Remote UNIX host synchronization

To use the remote UNIX host user synchronization with RADIUS users, passwordless SSH login is required to be set on the remote host.

- **OpenSSH server** – the host which is synchronized (the email server)
- **OpenSSH client** – the Radius Manager server which synchronizes the remote host

The following steps have to be followed in order to set up the passwordless SSH login successfully.

1. Generate your OpenSSH protocol 2 RSA key:

```
[root@localhost]# ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
8c:5f:0c:ea:8a:e6:dd:a0:45:d6:e9:42:3e:9a:5a:95 root@dtk.localdomain
```

Answer with enter to every question. Use empty passphrase and use the default file name for key.

2. Append the contents of your public key to the *authorized_keys* file on the remote OpenSSH server:

```
[root@localhost]# cat ~/.ssh/id_rsa.pub | ssh 192.168.0.4 "cat - >> ~/.ssh/authorized_keys"
root@192.168.0.4's password:
```

Where 192.168.0.4 is the remote server. When it is asking for the root password of the remote server You have to enter the proper password. The *.ssh* subfolder must exists on the remote host in */root* folder before issuing the previous command. Create the *.ssh* folder manually if required.

After completing this operation, You can test the passwordless SSH access to the remote server using the following remote ls command:

```
[root@localhost]# ssh 192.168.0.4 ls
download
install
mail
work
```

Rootexec permission problem

On some Linux systems due to the system security Radius Manager installer is unable to set the 4755 permission on rootexec binary. To fix it issue the following command from Linux shell:

```
[root@localhost]# chmod 4755 /usr/local/sbin/rootexec
```

Fine tuning the Apache WEB server

Edit the Apache configuration files to enable it to use the **.htaccess** files.

On **Fedora** edit the **/etc/httpd/conf/httpd.conf** and set **AllowOverride All** instead of AllowOverride None in section *<Directory "/var/www/html">:*

```
<Directory "/var/www/html">
    AllowOverride All
```

On **Debian** the configuration file is **/etc/apache2/sites-enabled/000-default**. Set **AllowOverride All** instead of AllowOverride None in sections *<Directory />* and *<Directory /var/www/>:*

```
<Directory />
    Options FollowSymLinks
    AllowOverride All
</Directory>
<Directory /var/www/>
    Options Indexes FollowSymLinks MultiViews
    AllowOverride All
    Order allow,deny
    allow from all
</Directory>
```

Restart Apache to actualize the changes.

REFERENCE

Radius Manager configuration files

system_cfg.php

The file system_cfg.php is located in radiusmanager/config folder. The main configuration entries are:

```
// database credentials

define("db_host", "localhost");
define("db_base", "radius");
define("db_user", "radius");
define("db_psw", "radius123");
define("db_host_ct", "localhost");
define("db_base_ct", "conntrack");
define("db_user_ct", "conntrack");
define("db_psw_ct", "conn123");
```

- **db_host** – RADIUS MySql database hostname or IP address.
- **db_base** – RADIUS MySql database name.
- **db_user** – RADIUS MySql database username.
- **db_psw** – RADIUS MySql database password.
- **db_host_ct** – CONNTRACK MySql database hostname or IP address.
- **db_base_ct** – CONNTRACK MySql database name.
- **db_user_ct** – CONNTRACK MySql database username.
- **db_psw_ct** – CONNTRACK MySql database password.

```
// system paths and files

define("radman_dir", "/var/www/html/radiusmanager");
define("raddb_dir", "/usr/local/etc/raddb");
define("tftp_dir", "tftpboot");
define("docsis_keyfile", "docsis_keyfile");
define("docsis_template", "docsis_template");
define("clients_conf", "clients.conf");
define("dhcpd_conf", "dhcpd.conf");
define("leases_file", "/var/state/dhcp/dhcpd.leases");
define("lang_dir", "lang");
define("invoice_dir", "invoice");
define("baseurl", "http://192.168.0.3/radiusmanager");
```

- **radman_dir** – Define the absolute path of Radius Manager HTML files.
- **raddb** – The full path of raddb directory.
- **tftp_dir** – Directory of TFTP boot files used by TFTP server.
- **docsis_keyfile** – DOCSIS keyfile name.
- **docsis_template** – DOCSIS TFTP template name.
- **clients_conf** – The name of clients.conf file.
- **lang_dir** – Folder name of language files.
- **dhcpd_conf** – DHCP configuration file name.

- **leases_file** – DHCP leases file name with full path.
- **lang_dir** – Directory of language files.
- **invoice_dir** – Directory of invoice template within the language directory.
- **baseurl** – The complete URL of Radius Manager.

```
// system definitions

define(“admin_user”, “admin”);
define(“rootexec_psw”, “12345”);
define(“nas_port_mt”, 1700);
define(“nas_port_chilli”, 3779);
define(“nas_port_cisco”, 1700);
define(“hotspot_ip”, “http://10.5.7.1”);
define(“no_limit_date”, “2020-12-31”);
define(“max_card_quantity”, 10000);
define(“cardsernum_integers”, 12);
define(“cardseries_padding “, 4);
define(“card_pin_len”, 8);
define(“card_psw_len”, 4);
define(“ias_pin_length”, 8);
define(“ias_psw_length”, 4);
define(“rndchars”, “0123456789ABCDEFGHIJKLMNOPQRSTVWXYZ”);
define(“rndstring_len”, 4);
define(“max_smsnums”, 3);
define(“max_pinfails”, 3);
define(“max_verifyfails”, 3);
define(“quickjump_max_pages”, 10);
define(“rows_per_page”, 50);
define(“csv_max_rows”, 1000000);
define(“cc_years”, 5);
define(“session_timeout”, 15);
define(“smtp_relay”, “localhost”);
define(“mail_from”, “admin@myisp.com”);
define(“mail_reply”, “admin@myisp.com”);
define(“mail_preview”, “admin@myisp.com”);
define(“mail_newuser”, “admin@localhost”);
define(“mail_localdomain”, “localhost.localdomain”);
define(“regexp_username”, ‘/^[a-z0-9._]+$/’);
define(“regexp_managername”, ‘/^[a-z0-9._]+$/’);
define(“regexp_mac”, ‘/^[:a-z0-9._]+$/’);
define(“regexp_psw”, ‘/^[a-zA-Z0-9._]+$/’);
define(“keep_connlog”, 190);
define(“keep_syslog”, 30);
define(“keep_actsrv”, 1);
define(“ping_timeout”, 1);
define(“pswact_len_email”, 60);
define(“pswact_len_sms”, 8);
define(“newpsw_len”, 4);
define(“grp_dec_inv”, true);
define(“default_simuse”, 1);
```

```
define("cmperthread", 50);
define("cm_community", "private");
define("mt_login_delay", 200000);
```

- **admin_user** – The name of the Radius Manager superuser.
- **rootexec_psw** – Defines the password for rootexec program. It has to be equivalent with that which is defined in */etc/radiusmanager.cfg.*
- **nas_port_mt** – Radius incoming packet port for Mikrotik. It is global for all Mikrotik NASes.
- **nas_port_chilli** – Radius incoming packet port for Chillispot. It is global for all Chillispot NAS's.
- **nas_port_cisco** – Radius incoming packet port for Cisco. It is global for all Cisco NASes.
- **hotspot_ip** – The address of the Hotspot server for http redirections.
- **no_limit_date** – Use this date for unlimited Unix account expiration.
- **max_card_quantity** – The maximum number of cards which can be generated at once.
- **cardnum_integers** – How many serial numbers digits to show when You list card codes (first column).
- **cardseries_padding** – Number of digits in card series.
- **card_pin_len –** PIN length of prepaid cards.
- **card_psw_len –** Password length of prepaid cards.
- **ias_pin_length –** IAS user name length.
- **ias_psw_length –** IAS password length.
- **rndchars –** Characters in account verification code.
- **rndstring_len –** Length of verification code.
- **max_smsnums** – Maximal number of card verification SMS.
- **max_pinfails** – Maximal number of wrong PIN codes.
- **max_verifyfails** – Maximal number of verification failures.
- **quickjump_max_pages** – How many pages to display in quickjumps.
- **rows_per_page** – Table rows per page.
- **csv_max_rows** – Number of rows in CSV file.
- **cc_years** – How many years to display in CC expiration listboxes.
- **session_timeout** – PHP session timeout in minutes.
- **smtp_relay** – SMTP relay.
- **mail_from** – Warning email sender.
- **mail_reply** – Warning email return path.
- **mail_preview** – Preview user of mass mail.
- **mail_newuser** – The system sends notifications about new users to this address.
- **mail_localdomain** – Warning email local domain.
- **regexp_username** – Regular expression for validating user names.
- **regexp_managername** – Regular expression for validating manager names.
- **regexp_mac** – Regular expression for validating MACs.
- **regexp_psw** – Regular expression for validating passwords.
- **keep_connlog** – Defines how many days to keep the connection log data.
- **keep_syslog** – Defines how many days to keep the system log data.
- **keep_actsrv** – Defines how many days to keep the actual service data.
- **ping_timeout** – Ping timeout value in seconds.
- **pswact_len_email** – Length of new password activation code sent in email.
- **pswact_len_sms** – Length of new password activation code sent in sms.
- **newpsw_len** – Length of generated password in password recovery.
- **grp_dec_inv** – Enable grouping of decimals on invoice forms.
- **default_simuse** – Default sim-use value of new users.
- **cmperthread** – Number of CMs per thread in cmtspoller module.
- **cm_community** – CM community string.
- **mt_login_delay** – Delay between Mikrotik API login attempt and response (in microsendonds).

```
// limits

define(“min_username_len”, 4);
define(“max_username_len”, 32);
define(“mac_username_len_mikrotik”, 17);
define(“mac_username_len_staros”, 12);
define(“min_psw_len”, 4);
define(“max_psw_len”, 32);
define(“mobile_minlen”, 6);
define(“mobile_maxlen”, 16);
define(“comment_maxlen”, 30);
```

- **min_username_len** – Define the minimal allowed length of the user name for the new user.
- **max_username_len** – Define the maximal allowed length of the user name for the new user.
- **mac_username_len_mikrotik** – Define the length of the Mikrotik MAC user name.
- **mac_username_len_staros** – Define the length of the StarOS MAC user name.
- **min_psw_len** – Define the minimal allowed password length.
- **max_psw_len** – Define the maximal allowed password length.
- **mobile_minlen** – Minimal allowed length of mobile number (verification).
- **mobile_maxlen** – Maximal allowed length of mobile number (verification).
- **comment_maxlen** – Displayed characters in comment field.

```
// card PDF export

define(“cards_per_page”, 10);
define(“username_x_pos”, 45);
define(“username_y_pos”, 36);
define(“pdfprint_expiration”, true);
define(“pdfprint_price”, true);
define(“pdfprint_serial”, true);
define(“pdfprint_series”, true);
define(“pdfprint_srvname”, true);
define(“psw_x_pos”, 45);
define(“psw_y_pos”, 44);
define(“pin_x_pos”, 33);
define(“pin_y_pos”, 40);
define(“price_x_pos”, 75);
define(“price_y_pos”, 19);
define(“date_x_pos”, 53);
define(“date_y_pos”, 53);
define(“serial_x_pos”, 27);
define(“serial_y_pos”, 61);
define(“series_x_pos”, 54);
define(“series_y_pos”, 61);
define(“srvname_x_pos”, 15);
define(“srvname_y_pos”, 26);
define(“user_font_type”, “Arial”);
define(“user_font_size”, 14);
define(“user_font_color”, “000000”);
```

```
define(“date_font_type”, “Arial”);
define(“date_font_size”, 10);
define(“date_font_color”, “000000”);
define(“price_font_type”, “Arial”);
define(“price_font_size”, 10);
define(“price_font_color”, “FFF7A1”);
define(“serial_font_type”, “Times”);
define(“serial_font_size”, 8);
define(“serial_font_color”, “CEDDFF”);
define(“series_font_type”, “Times”);
define(“series_font_size”, 8);
define(“series_font_color”, “CEDDFF”);
define(“srvname_font_type”, “Arial”);
define(“srvname_font_size”, 12);
define(“srvname_font_color”, “DFEFF3”);
define(“card_left_margin”, 13);
define(“card_top_margin”, 13);
define(“card_classic_bg_filename”, “classic_bg.png”);
define(“card_refill_bg_filename”, “refill_bg.png”);
define(“card_bg_width”, 85);
define(“card_bg_height”, 50);
```

- **cards_per_page** – Number of cards per A4 sheet.
- **username_x_pos** – User name x position on classic prepaid card.
- **username_y_pos** – User name y position on classic prepaid card.
- **pdfprint_expiration** – Enable printing expiration.
- **pdfprint_price** – Enable printing price.
- **pdfprint_serial** – Enable printing card serial number.
- **pdfprint_series** – Enable printing card series number.
- **pdfprint_srvname** – Enable printing service name.
- **psw_x_pos** – Password x position on classic prepaid card.
- **psw_y_pos** – Password y position on classic prepaid card.
- **pin_x_pos** – PIN x position on refill card.
- **pin_y_pos** – PIN y position on refill card.
- **price_x_pos** – Price x position on card.
- **price_y_pos** – Price y position on card.
- **date_x_pos** – Valid till x position on card.
- **date_y_pos** – Valid till y position on card.
- **serial_x_pos** – Service name x position on card.
- **serial_y_pos** – Service name y position on card
- **series_x_pos** – Series x position on card.
- **series_y_pos** – Series y position on card.
- **srvname_x_pos** – Service name x position on card.
- **srvname_y_pos** – Service name y position on card
- **user_font_type** – PIN / password font typeface.
- **user_font_size** – PIN / password font size.
- **user_font_color** – PIN / password font color.
- **date_font_type** – Date font typeface.
- **date_font_size** – Date font size.
- **date_font_color** – Date font color.
- **price_font_type** – Price font typeface.

- **price_font_size** – Price font size.
- **price_font_color** – Price font color.
- **serial_font_type** – Serial font typeface.
- **serial_font_size** – Serial font size.
- **serial_font_color** – Serial font color.
- **series_font_type** – Series font typeface.
- **series_font_size** – Series font size.
- **series_font_color** – Series font color.
- **srvname_font_type** – Serial font typeface.
- **srvname_font_size** – Serial font size.
- **srvname_font_color** – Serial font color.
- **card_left_margin** – Left margin.
- **card_top_margin** – Top margin.
- **card_classic_bg_filename** – Classic prepaid card background picture file.
- **card_refill_bg_filename** – Refill card background picture file.
- **card_bg_width** – Prepaid card background picture width.
- **card_bg_height** – Prepaid card background picture height.

```
// unix executables

define(“cmd_rootexec”, “/usr/local/sbin/rootexec”);
define(“cmd_radclient”, “/usr/local/bin/radclient”);
define(“cmd_starutil”, “/usr/local/bin/starutil”);
define(“cmd_useradd”, “/usr/sbin/useradd”);
define(“cmd_userdel”, “/usr/sbin/userdel”);
define(“cmd_chmod”, “/usr/bin/chmod”);
define(“cmd_usermod”, “/usr/sbin/usermod”);
define(“cmd_passwd”, “/usr/sbin/passwd”);
define(“cmd_edquota”, “/usr/sbin/edquota”);
define(“cmd_ping”, “/bin/ping”);
define(“cmd_docsis”, “/usr/local/bin/docsis”);
```

- **cmd_rootexec** – Rootexec executable with full path.
- **cmd_radclient** – Radclient utility with full path.
- **cmd_starutil** – Starutil utility with full path.
- **cmd_useradd** – Useradd command with full path.
- **cmd_userdel** – Userdel command with full path.
- **cmd_chmod** – Chmod command with full path.
- **cmd_usermod** – Usermod command with full path.
- **cmd_passwd** – Passwd command with full path.
- **cmd_edquota** – Edquota command with full path.
- **cmd_ping** – Ping command with full path.
- **cmd_docsis** – Docsis utility executable with full path.

paypal_cfg.php

Radius Manager supports PayPal Express Checkout, PayPal Website Payments Pro and PayPal Website Payments Standard API (www.paypal.com). A short overview of the available APIs:

- **PayPal Express Checkout** works with premier and business accounts and can be used to accept balance and CC payments.
- **PayPal Website Payments Pro** (CC processing) will work only with a Pro account or better and requires the merchant to be registered from US / UK.
- **PayPal Website Payments Standard** can be used for balance and CC payments and it supports multiple merchant countries.

PayPal subsystem configures via paypal_cfg.php file which is located in config folder. The main configuration entries in paypal_cfg.php are:

```
// API credentials of PayPal Express Checkout and PayPal Website Payments Pro

define('API_USERNAME', 'username');
define('API_PASSWORD', 'password');
define('API_SIGNATURE', 'signatue');

// API credentials of PayPal Website Payments Standard

define("DEFAULT_USER_NAME", "username");
define("DEFAULT_PASSWORD", "password");

define("DEFAULT_EMAIL_ADDRESS", "info@mycompany.com");
define("DEFAULT_IDENTITY_TOKEN", "token");

define("DEFAULT_EWP_CERT_PATH", "certs/ewp-cert.pem");
define("DEFAULT_EWP_PRIVATE_KEY_PATH", "certs/ewp-key.pem");
define("DEFAULT_EWP_CERT_ID", "cert_id");
define("PAYPAL_CERT_PATH", "certs/paypal-cert.pem");

// enable sandbox test mode

define("TEST_MODE", TRUE);

// other

define("CC_MERCHANT_COUNTRY", "US");
```

Description of the configuration entries:

- **API_USERNAME** – API user name (Express Checkout and Website Payments Pro).
- **API_PASSWORD** – API password (Express Checkout and Website Payments Pro).
- **API_SIGNATURE** – API signature (Express Checkout and Website Payments Pro).
- **DEFAULT_USER_NAME** – API user name (Website Payments Standard).
- **DEFAULT_PASSWORD** – API password (Website Payments Standard).
- **DEFAULT_EMAIL_ADDRESS** – merchant email address to be displayed on PayPal site (Website Payments Standard).

- **DEFAULT_IDENTITY_TOKEN** – API identity token (Website Payments Standard).
- **DEFAULT_EWP_CERT_PATH** – API certificate public key (Website Payments Standard).
- **DEFAULT_EWP_PRIVATE_KEY_PATH** – API certificate private key (Website Payments Standard).
- **DEFAULT_EWP_CERT_ID** – API certificate ID (Website Payments Standard).
- **PAYPAL_CERT_PATH** – PayPal certificate public key (Website Payments Standard).
- **TEST_MODE** – Set it to TRUE to use the Sandbox testing environment or false to use the real PayPal account.
- **CC_MERCHANT_COUNTRY** – US or UK, used for Website Payments Pro API.

For testing purposes use the PayPal Sandbox site. Create a testing account and define the credentials in paypal_cfg.php. When testing, be sure You are logged on to PayPal developer site all the time.

Generating SSL certificates

You need a SSL certificate to use the **Website Payments Standard** API. To generate a certificate follow the next steps exactly:

Generating Your Private Key Using OpenSSL

Using the openssl program, enter the following command to generate your private key. The command generates a 1024-bit RSA private key that is stored in the file ewp-key.pem:

```
[root@localhost]# openssl genrsa -out ewp-key.pem 1024
```

Generating Your Public Certificate Using OpenSSL

The public certificate must be in PEM format. To generate your certificate, enter the following openssl command, which generates a public certificate in the file my-pubcert.pem:

```
[root@localhost]# openssl req -new -key ewp-key.pem -x509 -days 365 -out ewp-cert.pem
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [GB]:US
State or Province Name (full name) [Berkshire]:John Smith
Locality Name (eg, city) [Newbury]:Albany
Organization Name (eg, company) [My Company Ltd]:My Company
Organizational Unit Name (eg, section) []:
Common Name (eg, your name or your server's hostname) []:billing.myisp.com
Email Address []:info@myisp.com
```

Uploading your public certificate to your PayPal account

1. Log in to your PayPal Business or Premier account
2. Click the Profile subtab.
3. In the Seller Preferences column, click the Encrypted Payment Settings link. The Website Payment Certificates page appears.
4. Scroll down the page to the Your Public Certificates section, and click the Add button. The 5. Add Certificate page appears.
6. Click the Browse button, and select the public certificate that you want to upload to PayPal from your local computer (*certs/ewp-cert.pem*).
7. Click the Add button.
8. After your public certificate is uploaded successfully, it appears in the Your Public Certificates section of the Website Payment Certificates page.
9. Copy the associated certificate ID to DEFAULT_EWP_CERT_ID field in *paypal_cfg.php*.

Downloading the PayPal public certificate from the PayPal website

1. Log in to your Business or Premier PayPal account.
2. Click the Profile subtab.
3. In the Seller Preferences column, click the Encrypted Payment Settings link.
4. Scroll down the page to the PayPal Public Certificate section.
5. Click the Download button, and save the file in a secure location on your local computer (*certs/paypal-cert.pem*).

netcash_cfg.php

Radius Manager system supports NetCash (www.netcash.co.za) credit card payment gateway. You need a NetCash merchant account to use this feature.

NetCash module is configurable via netcash_cfg.php which is located in radiusmanager/config folder. The configuration entries in netcash_cfg.php are:

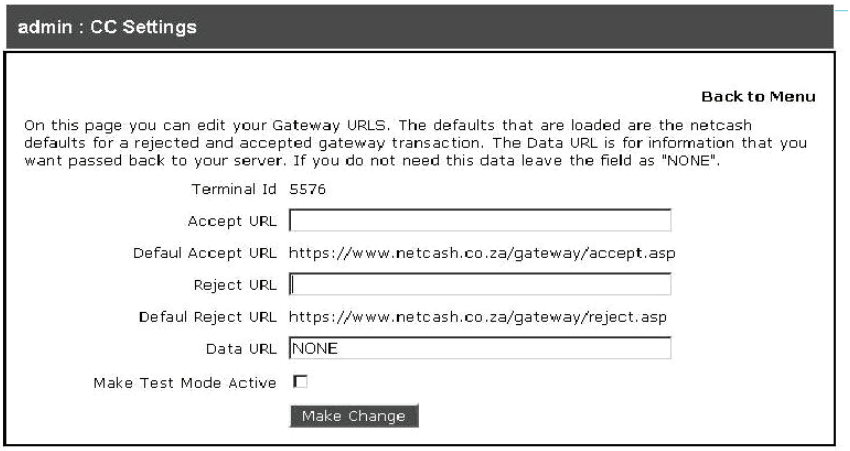
```
// Netcash credentials

define('NETCASH_USERNAME', 'username');
define('NETCASH_PASSWORD', 'password');
define('NETCASH_PIN', '12345');
define('TERMINAL_NUMBER', '12345');

// other data

define('NETCASH_EMAIL', 'info@mycompany.com');
```

Description of the configuration entries:

- **NETCASH_USERNAME** – NetCash merchant user name.
- **NETCASH_PASSWORD** – NetCash merchant password.
- **NETCASH_PIN** – NetCash PIN code.
- **TERMINAL_NUMBER** – NetCash terminal number.
- **NETCASH_EMAIL** – Email address to receive transaction reports sent by NetCash.

You have to define the Accept URL and Reject URL on Netcash.co.za site. Enter it in the following form:

http://yourhost/radiusmanager/netcash_return.php



authorizenet_cfg.php

From version 3.7 Radius Manager supports authorize.net to accept credit cards online (www.authorize.net). The system doesn't store any data on the host, insteam it simply forwards the CC data to authorize.net (AIM integration method). Be sure You are running the HTTP server in secure mode (SSL) when You are working with credit cards!

Authorize.net module is configurable via authorizenet_cfg.php which is located in radiusmanager/config directory. The configuration entries are:

```
// Authorize.net API Login ID and Transaction Key

define('AUTHORIZENET_USERNAME', 'login_id');
define('AUTHORIZENET_TRANSKEY', 'transaction_key');
define("AUTHORIZENET_TEST_MODE", TRUE);

// default URL's

define('AUTHORIZENET_URL_TEST', 'https://test.authorize.net/gateway/transact.dll');
define('AUTHORIZENET_URL_LIVE', 'https://secure.authorize.net/gateway/transact.dll');
```

Description of the configuration entries:

- **AUTHORIZENET_USERNAME** – API user name.
- **AUTHORIZENET_TRANSKEY** – API transaction key.
- **AUTHORIZENET_TEST_MODE** – Set it to TRUE if You use test mode or FALSE if You use live mode.
- **AUTHORIZENET_URL_TEST** – The test mode gateway URL. Use the default value here.
- **AUTHORIZENET_URL_LIVE** – The live mode gateway URL. Use the default value here.

dps_cfg.php

DPS Express Payment gateway (www.paymentexpress.com) is available in Radius Manager 3.8 to accept credit cards online. It supports mainly the New Zealand region. The system doesn't store any data on the host, the CC handling is done one the DPS site (redirection). When a CC has processed (success or failure) the browser gets directed back to Radius Manager site.

DPS module is configurable via dps_cfg.php which is located in radiusmanager/config directory. The main configuration entries are:

```
define("DPS_URL",        "https://sec2.paymentexpress.com/pxpay/pxaccess.aspx");
define("DPS_USERNAME",   "username");
define("DPS_KEY",        "key");

define("DPS_RETURN_URL", "dps_return.php");
define("DPS_EMAIL",      "info@mycompany.com");
```

Description of the configuration entries:

- **DPS_URL** – The payment gateway URL. Use the default value here.
- **DPS_USERNAME** – API user name.
- **DPS_KEY** – API transaction key.
- **DPS_RETURN_URL** – The URL called after the transaction.
- **DPS_EMAIL** – The email address of the merchant.
- **currency_dps** – The allowed currencies as they are defined in DPS specifications.

2co_cfg.php

From version 3.9 Radius Manager supports 2Checkout.com online payment provider (www.2checkout.com). It support multiple countries and currencies and very easy to configure.

The configuration entries are:

```
// API credentials

define('_2CO_SID', "vendor_id");
define('_2CO_SECRET', "secret_word");

// additional data

define("_2CO_TEST_MODE", TRUE);
define("_2CO_SKIP_LANDING", "1");
```

Description of the configuration entries:

- **_2CO_SID** – Account identifier. Get if from 2Checkout.com.
- **_2CO_SECRET** – Secret transaction key. Get if from 2Checkout.com.
- **_2CO_TEST_MODE** – Enable (TRUE) or disable (FALSE) test mode. Also configure the test mode in 2Checkout.com control panel, setting this variable is not enough to activate it.
- **_2CO_SKIP_LANDING** – Do not show the cart review page in transactions.
- **currency_2co** – The allowed currencies as they are defined in 2Checkout specifications.

radiusmanager.cfg

The file radiusmanager.cfg is located in /etc folder. It is the configuration file for the helper binaries. The content of radiusmanager.cfg is:

```
db_host                 localhost                   ; mysql RADIUS host address
db_name                 radius                      ; mysql RADIUS database name
db_user                 radius                      ; mysql RADIUS username
db_psw                  radius123                   ; mysql RADIUS password
db_host_cts             localhost                   ; mysql CONNTRACK host address
db_name_cts             conntrack                   ; mysql CONNTRACK database name
db_user_cts             conntrack                   ; mysql CONNTRACK username
db_psw_cts              conn123                     ; mysql CONNTRACK password
db_sock                 /var/lib/mysql/mysql.sock   ; mysql main socket location
radman_path             /var/www/html/radiusmanager         ; Radius Manager full path
rootexec_psw            12345                       ; rootexec password
inactivity              10                          ; timeout clean the inactive sessions
poller_pause            60                          ; disconnect handler cycle pause
cmpoller_pause          300                         ; CM CTS poller cycle pause in seconds
radclient               /usr/local/bin/radclient    ; radclient path
starutil                /usr/local/bin/starutil     ; starutil path
nas_port_mt             1700                        ; global POD port of Mikrotik
nas_port_chilli         3779                        ; global POD port of ChilliSpot
nas_port_cisco          1700                        ; global POD port of Cisco
mt_api_port             8728                        ; global API port of Mikrotik
smtp_relay              localhost                   ; smtp relay
mail_from               admin@myisp.com             ; email sender address
mail_reply              admin@myisp.com             ; email reply adddress
mail_localdomain        localhost.localdomain       ; email local domain
cts_port                4950                        ; port for accepting syslog messages
cts_blocksize           5000                        ; CTS data block size
cts_file                /tmp/rmconnlog              ; filename of temp. CTS storage
cts_threads             8                           ; number of CTS threads (default 8)
cts_flush               30                          ; flush buffer in every n seconds
cts_username_len        32                          ; max. length of CTS user name
cts_allindex            yes                         ; create all  indexes on CTS tables
cts_logallip            no                          ; log all IP addresses
socket_rmconntrack      /tmp/rmconntrack            ; rmconntrack server socket
socket_rmacnt           /tmp/rmacnt                 ; rmacnt client socket
socket_rmpoller         /tmp/rmpoller               ; rmpoller client socket
pid_dir                 /var/run                    ; directory of PID files
```

Description of the configuration entries:

- **db_host** – Define the RADIUS MySql database host.
- **db_name** – Define the RADIUS MySql database name.
- **db_user** – Define the RADIUS MySql database user.
- **db_psw** – Define the RADIUS MySql database password.
- **db_host_cts** – Define the CONNTRACK MySql database host.
- **db_name_cts** – Define the CONNTRACK MySql database name.
- **db_user_cts** – Define the CONNTRACK MySql database user.

- **db_psw_cts** – Define the CONNTRACK MySql database password.
- **db_sock** – Define the MySql socket location.
- **radman_path** – Define the Radius Manager full web path.
- **rootexec_psw** – The password for executing *rootexec* binary.
- **inactivity** – Define the timeout in minutes for automatically cleaning up the inactive accounting sessions.
- **poller_pause** – Define the time interval in seconds when *rmpoller* checks for the online users and calculates the limits. Use values 60 – 300 seconds. Using smaller values You will have more accurate disconnect precisity. Higher values enables the users to go into negative (Bytes, time).
- **cmpoller_pause** – Define the pause in seconds between two *cmpoller.php* cycles. Use values of 60 – 300 seconds. When using smaller values You will have more accurate online CM list available.
- **radclient** – Full path of the *radclient* binary file.
- **starutil** – Full path of the *starutil* binary file.
- **nas_port_mt** – RADIUS POD port for all Mikrotik NASes in the system.
- **nas_port_chilli** – RADIUS POD port for all StarOS NASes in the system.
- **nas_port_cisco** – RADIUS POD port for all Cisco NASes in the system.
- **mt_api_port** – Global API port of Mikrotik.
- **smtp_relay** – SMTP server IP address for the binaries. The IP address has to be resolvable in order to use it. Define it in */etc/hosts* .
- **mail_from** – The email address to be displayed as sender.
- **mail_reply** – The email address replying emails.
- **mail_localdomain** – The domain name for creating email addresses for RADIUS users with unspecified email addresses. The final address will look like: radius_username@mail_localdomain
- **cts_port** – Define the listener port for syslog messages.
- **cts_blocksize** – CTS data block size
- **cts_file** – File name of temporary connection storage.
- **cts_threads** – Number of thread for connection data processing.
- **cts_flush** – Flush buffer in every n seconds (default 30 seconds).
- **cts_username_len** – Maximal length of the stored user name in CTS db.
- **cts_allindex** – Create all indexes on CTS tables (use with small tables only).
- **cts_logallip** – Log all IP addresses, not only the authenticated users.
- **socket_rmconntrack** – Rmconntrack server socket.
- **socket_rmacnt** – Rmacnt client socket.
- **socket_rmpoller** – Rmpoller client socket.
- **pid_dir** – Directory of PID files.

Radius Manager daemons, utilities

For fixing the issues in the most easiest way it is necessary to understand what Radius Manager components do, how they work. The brief description of Radius Manager executable files and utilities is available here.

Binary files:

- **rmauth** – Checks the capping, authenticates users, sets bandwidth etc. It is called from *raddb/users.* It is essential part of Radius Manager system.

- **rmacnt** – Closes the inactive accounting sessions and has many more major functions. Called from *raddb/acct_users*. It is essential part of Radius Manager system.

- **rmpoller** – This multi function daemon checks for expired accounts, disconnects expired users, sends warning emails, sets bandwidth dynamically etc. It is a standalone process and must be running all the time. It is essential part of Radius Manager system.

- **rmconntrack** – Receives Mikrotik syslog messages, stores CTS data.

- **rootexec** – Used to execute external UNIX programs from PHP. It is essential part of Radius Manager system.

PHP utilities:

- **rmscheduler.php** – This program is running regularly from *cron* and it is executed daily once. The recommended time for this is some minutes after midnight. It will check the expired RADIUS accounts, unpaid invoices and disables UNIX users. Also, it is a service type changer for scheduled service changes, disconnects postpaid users on the 1st day of the month (not disables them) for correct postpaid billing and sends warning emails. It is also responsible for account auto renewing.

- **wlanpoller.php** – Used for getting wireless clients data from APs. It is invoked from a cronjob.

- **cmtspoller.php** – Used for getting data from CTMS and cable modems. It is invoked from a cronjob.

These binaries store their configuration data in */etc/radiusmanager.cfg* and in *config/ system_cfg. php*.

SMS gateway

The SMS gateway is configured in file *api.php*. It implements the HTTP to SMS gateway function s. The *api.php* fiie is not encoded with ionCube, so You can add your own SMS gateway using PHP programming language. The list of functions available in *api.php* are:

Name:

api_verifyuser

Description:

The function is called upon self registering the user, right after submitting the form. From this function You can call your own SMS gateway (HTTP gateway with CURL or a shell script to use your own mobile phone) to send the verification code for the user.

Parameters:

$username
$password
$firstname
$lastname
$address
$city
$zip
$country
$state
$phone
$mobile
$email
$srvid
$verifycode
&$errmsg

Results:

true - API succeeded
false - API error

Remarks:

The function includes an example of integrating the clickatell.com HTTP -> SMS gateway.

LEGAL NOTE