

Libraries and tools to manage Mikrotik boards using RouterOS API

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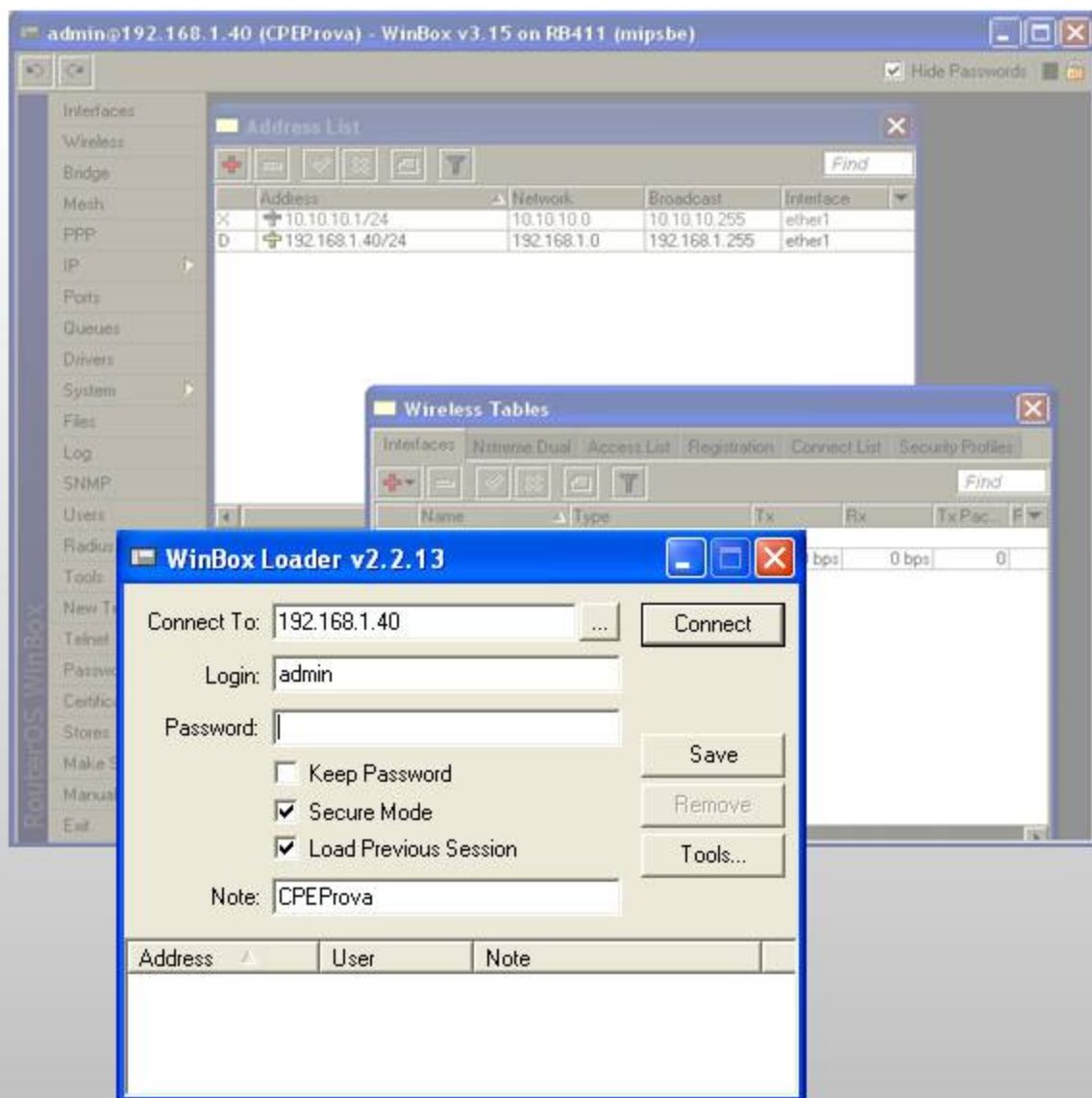
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TOWNET is using mikrotik boards and routers operating system for many of its products.

- Competence on the use of the operating system for routing purposes
- Capability of adapting routers machines to the customer's needs

WISPMAX is a branch of company, as an official on line Mikrotik distributor. We also carry a wide range of high quality antennas and accessories.

LIMITS OF ROUTEROS INTERFACE



Mikrotik interface is complete and useful for expert user, but not easy for end user.

It's difficult to give a limited access to the end-user, giving only access to some of the configuration tools.

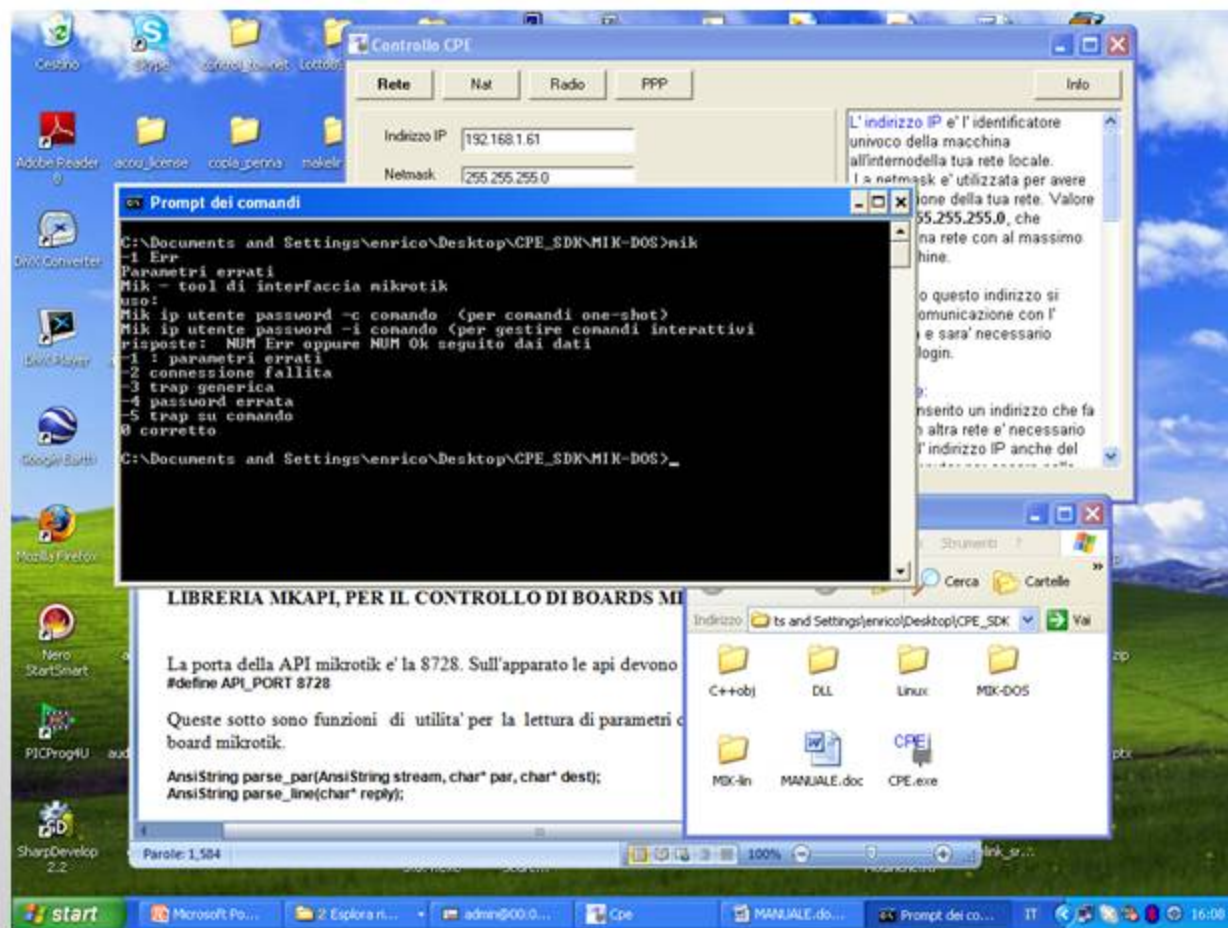
There isn't an error proof interface.

TOWNET API TOOLS

A set of instruments to support the develop of applications to control a routers machine.

The communication is based on mikrotik API

It's possible to use a mikrotik board from differend kind of applications written under windows or linux.



A **C++** class for:

- Login to a mikrotik board
- Execution of non interactive commands
- Execution of interactive commands

All with the purpose of achieving the better speed possible and to develop monolithic applications.

It manages directly, hiding the complexity of:

- mikrotik api protocol
- errors and traps
- md5 cryptography
- socket level

LIBRARY DISTRIBUTED AS

C++ object files and library header for windows

Files .o and header for linux

Dll for windows, to use with other languages

Applications:

ms-dos and linux command line tool

(to use for scripts, web applications or directly)

Graphical configuration utility for a CPE

MK API LIBRARY INTERFACE

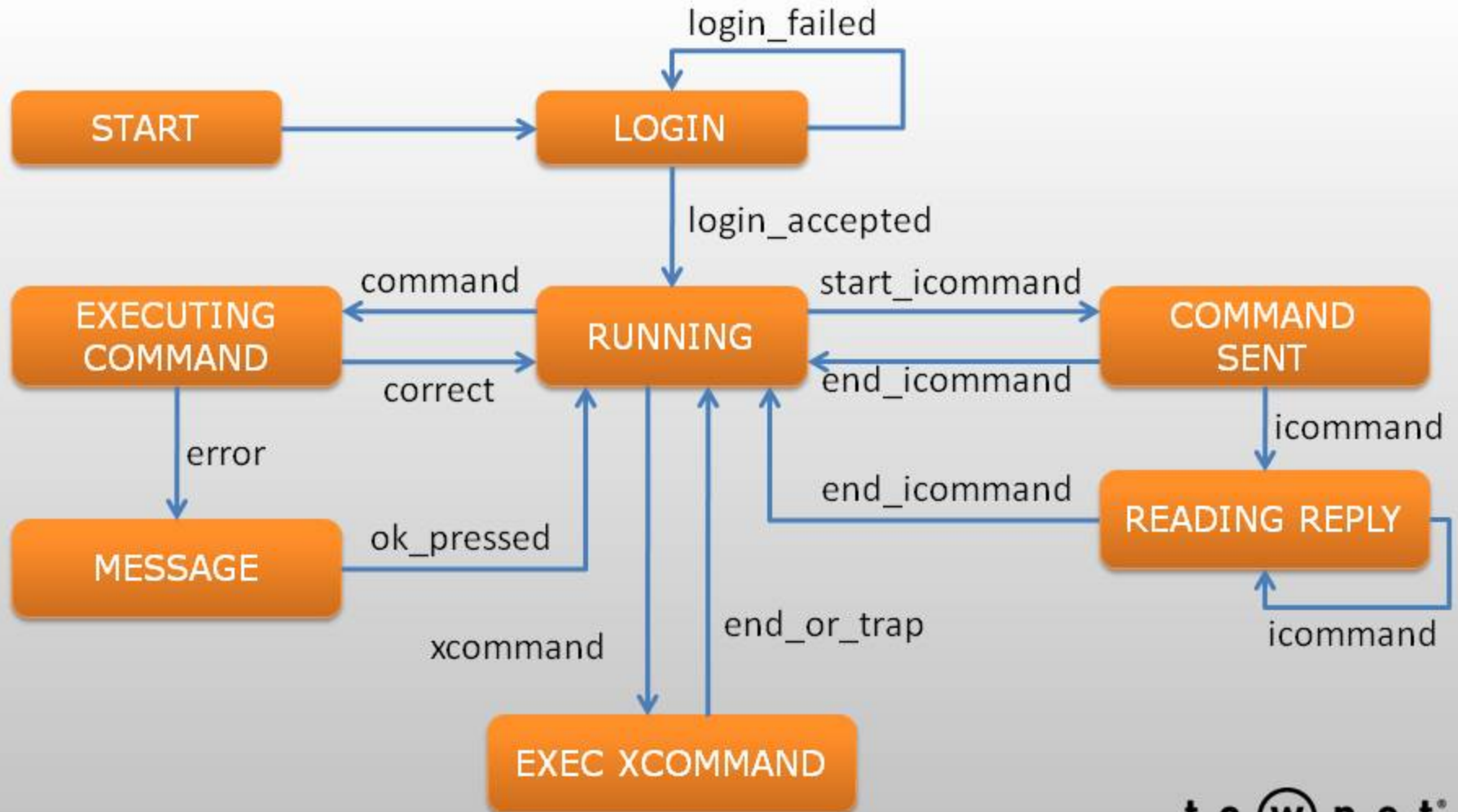
```
class mikrotikBoard
{ public:
    AnsiString login(AnsiString remote, AnsiString user,
                    AnsiString pass);

    AnsiString command(AnsiString text);
    AnsiString xcommand(AnsiString text);
    void start_icommand(AnsiString cmd);
    AnsiString icommand();
    AnsiString end_icommand();
};

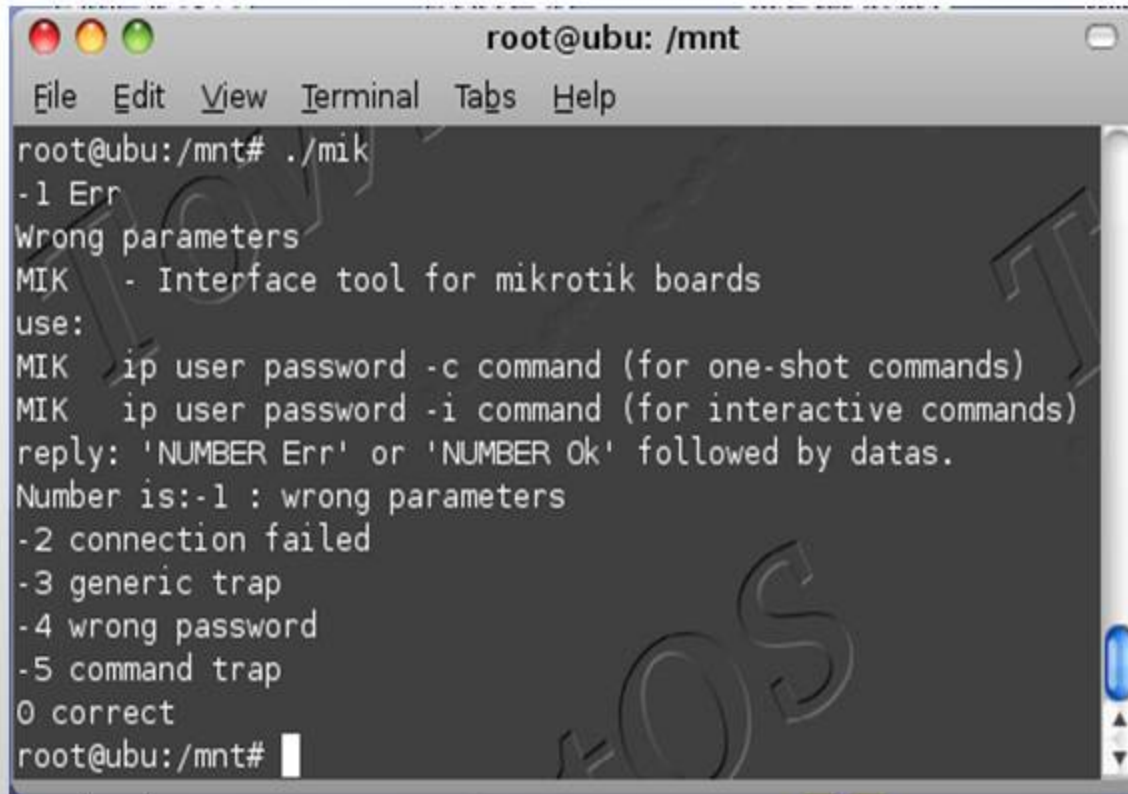
AnsiString parse_par(AnsiString stream, char* par, char* dest);
AnsiString parse_line(char* reply);
```

Login: receive hostname or ip, username and password.
The result is an empty string if correct, or an error description.

MKAPI STATE DIAGRAM



COMMAND LINE UTILITY MIK



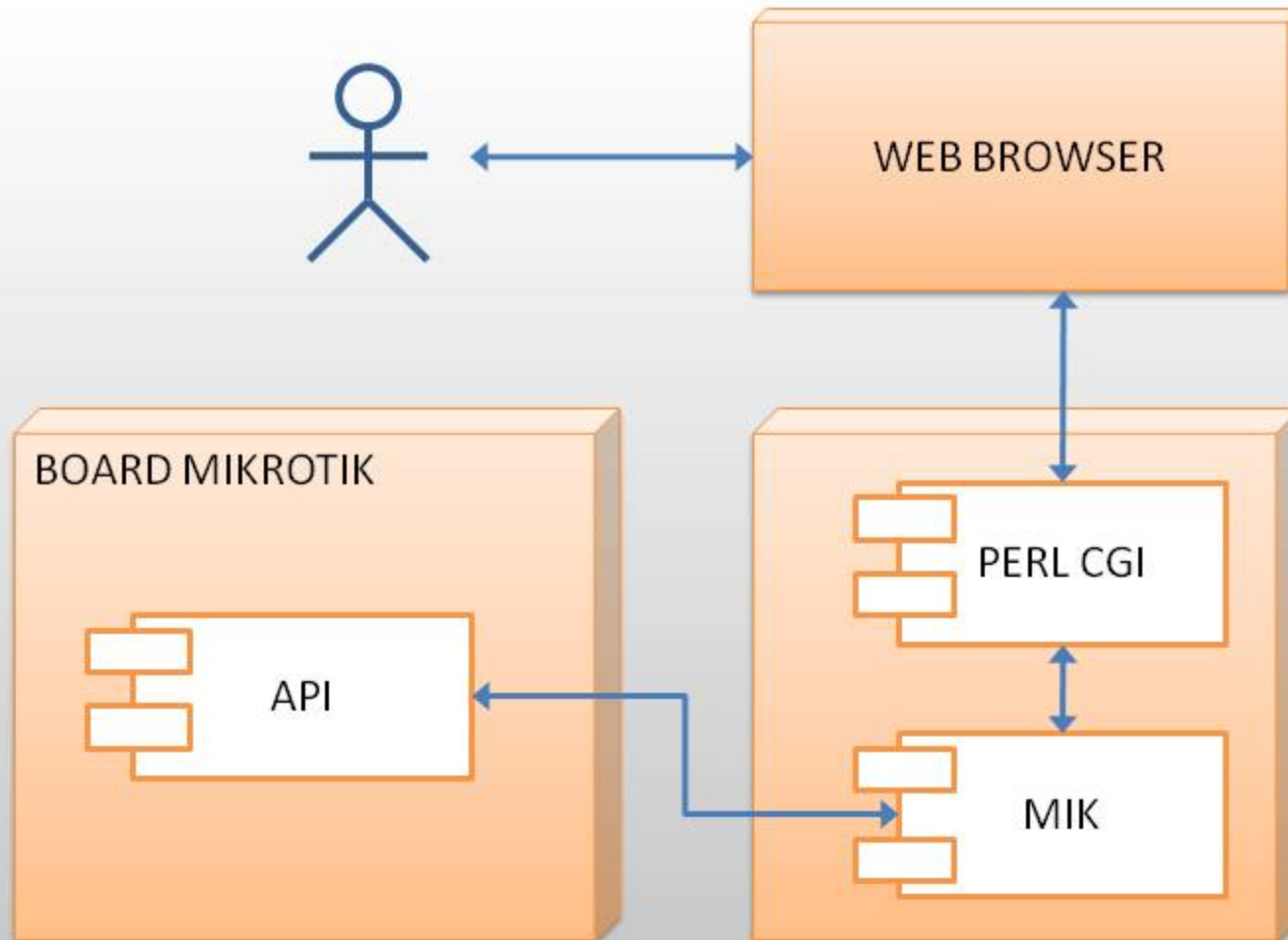
```
root@ubu: /mnt
File Edit View Terminal Tabs Help
root@ubu:/mnt# ./mik
-1 Err
Wrong parameters
MIK - Interface tool for mikrotik boards
use:
MIK ip user password -c command (for one-shot commands)
MIK ip user password -i command (for interactive commands)
reply: 'NUMBER Err' or 'NUMBER Ok' followed by datas.
Number is:-1 : wrong parameters
-2 connection failed
-3 generic trap
-4 wrong password
-5 command trap
0 correct
root@ubu:/mnt#
```

Execute a command on a mikrotik board and write out the result

Useful:

- Directly from the command line
- From an application that uses the shell() function
- From a script, to run a command on many boards
- From a CGI of a web site

UML DEPLOYMENT DIAGRAM



Use of 'mik' program to develop a web application.

EXAMPLE USING "MIK"

This script ask all the addresses of a list of boards on my network.

```
{  
for i in 1 7 32 45 101 ; do  
  mik 10.0.0.$i admin mypassword -c /ip/address/print  
done  
} | grep "address="
```

The result is like:

```
address=10.0.0.1  
address=81.34.23.11  
address=10.0.0.2
```

CPE CONTROL UTILITY



A C++ application written using MAPI library
Monolithic and complete.
For an end-user that want to complete the configuration of his CPE.

Simple and intuitive.

You can have a pre-configured CPE, reducing installation costs

Real time monitor of quality of connection and signal strength to help pointing the antenna.

We can easily customize the application to meet the need of different providers.

EASY NETWORK MANAGEMENT

Controllo CPE

Rete | Nat | Radio | PPP | Info

Indirizzo IP: 192.168.1.61

Netmask: 255.255.255.0

☐ Usa DHCP per la rete interna

Indirizzo iniziale:

Indirizzo finale:

DNS primario: 192.168.1.1

DNS secondario: 0.0.0.0

Applica

L'indirizzo IP e' l' identificatore univoco della macchina all'interno della tua rete locale. La netmask e' utilizzata per avere la dimensione della tua rete. Valore tipico e' 255.255.255.0, che significa una rete con al massimo 256 macchine.

Cambiando questo indirizzo si perde la comunicazione con l' interfaccia e sara' necessario ripetere il login.

Attenzione:
Se viene inserito un indirizzo che fa parte di un'altra rete e' necessario cambiare l' indirizzo IP anche del

The user can handle his own ip address and netmask

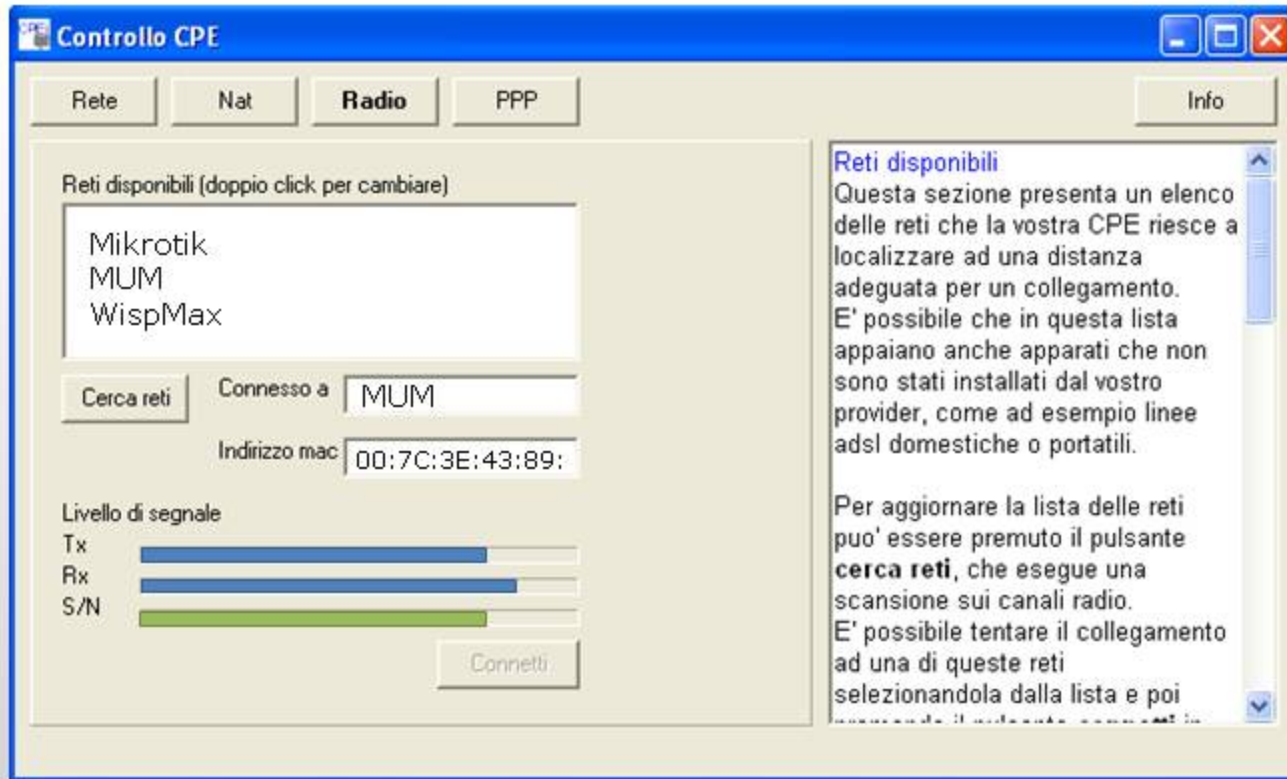
Each user can select to enable a dhcp server on his private network and can define the range of private addresses and the DNS servers to use.

EASY ADMINISTRATION FOR SERVICES



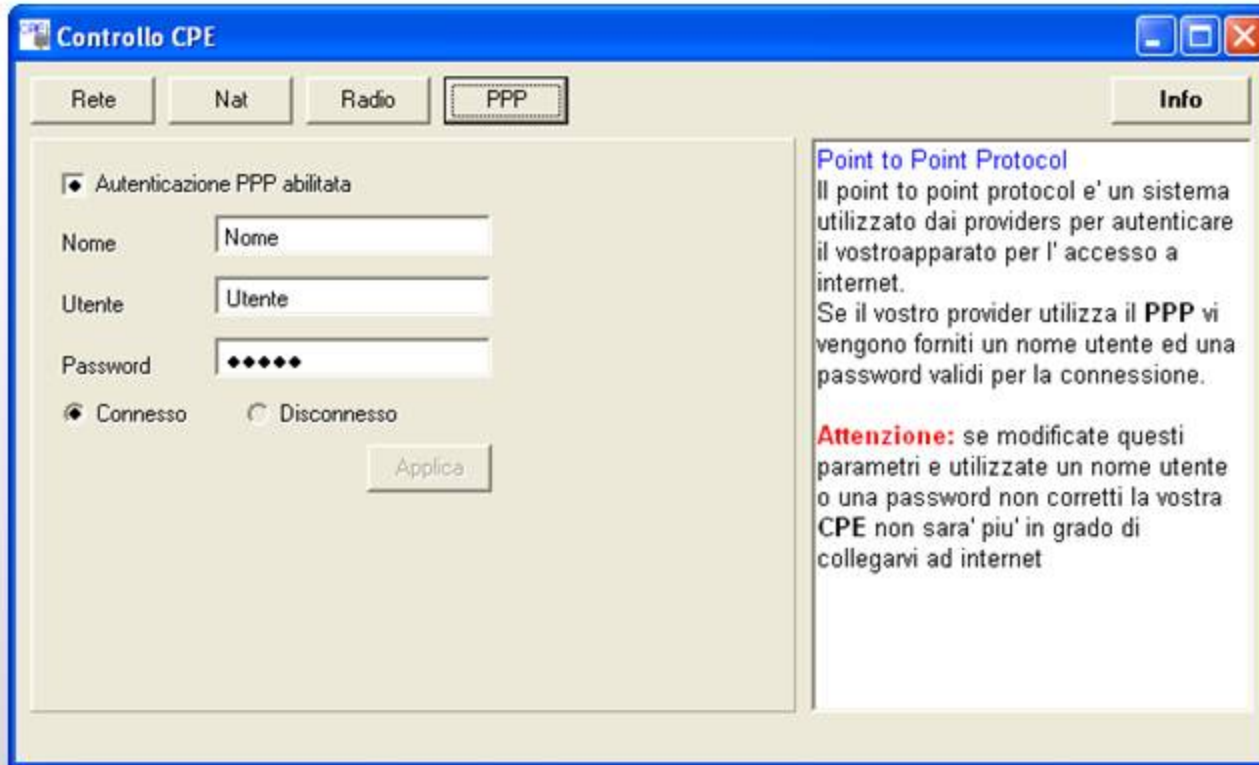
Each user that has a static ip address can manage his own port forwards, to offer services, for example publishing web sites that are in his own machine.

USEFUL TO POINT THE ANTENNA



The application shows in real time the signal/noise level and the tx/rx quality for the connection. It allows to find the base station and to point the antenna also without technical experience.

USEFUL TO POINT THE ANTENNA



The screenshot shows a software window titled "Controllo CPE" with a blue title bar. It contains four tabs: "Rete", "Nat", "Radio", and "PPP" (which is selected). An "Info" button is located in the top right corner. The main area is divided into two panes. The left pane contains the following settings:

- ☒ Autenticazione PPP abilitata
- Nome:
- Utente:
- Password:
- ☒ Connesso ☐ Disconnesso
-

The right pane contains the following text:

Point to Point Protocol
Il point to point protocol e' un sistema utilizzato dai providers per autenticare il vostro apparato per l'accesso a internet.
Se il vostro provider utilizza il PPP vi vengono forniti un nome utente ed una password validi per la connessione.

Attenzione: se modificate questi parametri e utilizzate un nome utente o una password non corretti la vostra CPE non sara' piu' in grado di collegarsi ad internet

The application permit to set the point to point connection parameters for the CPE, and show if the board is really connected to the network.

CONCLUSIONS

- Less work for the provider: the user can mount and point the CPE with a minimal help, that can be given by phone
- More security for the network: there is less risk that an error on configuring a CPE can became a problem for other users
- More friendly for the user: the user has an instrument to handle his own network . It's seen as a better quality of service
- Only few KB, More reliable and fast than C# Sample code in Mikrotik Forum
- Economic Positive effect to WISP Business Model
- Market protection for your personalized equipments.

Authentication PPPoE, PPTP, L2TP, PPPoA, HotSpot, MAC, 802.1

Automatic **TAP** Zero CPE Configuration

Configuration based on Web or Terminal

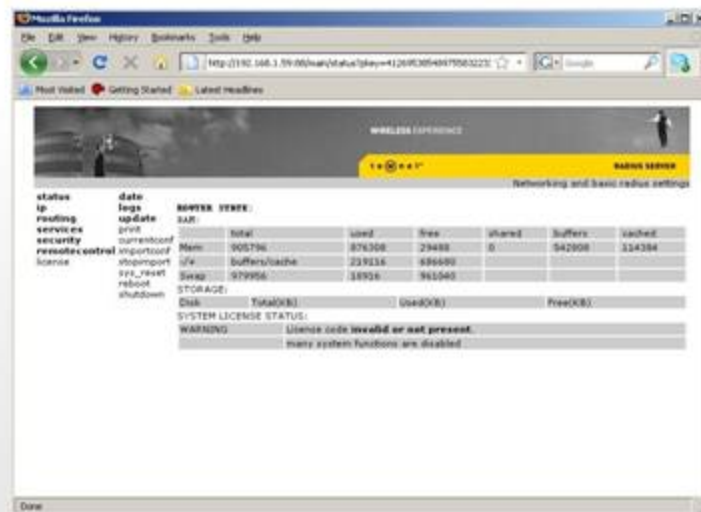
Multilevel Configuration Menu based on **MLText®**

Cluster configuration

Operativ Sistem **TownetOS®** Linux Based

SMS authentication

IP POOL Centralization



Townet OS®



NEW IDU CARRIER GRADE and SURGE PROTECTOR

40 W **POWER SUPPLY** with DC input 12 to 48V DC, **SURGE PROTECTOR**

POE GIGABIT ETHERNET, UPS BATTERY CONNECTOR, STATE LEDS

3 STAGE SURGE PROTECTOR

POE 25+5KV

NAKED VERSION

OR IP68 OUTDOOR CASE





NEW ENCLOSURE WX552002

The ideal solution for professional wireless application.

Ready for Mikrotik

Add your RouterBoard and Radio

Features and Benefits

- Compact waterproof IP67 enclosure
- Integrated 5 GHz, 20 dBi antenna
- DC ground
- Includes integrated RJ45 Ethernet Connector with cable gland and integrated pigtail with U.FI connector
- Vertical, Horizontal and 45° polarization

802.11 n
compatible



NEW ENCLOSURE WX552002

An integrated high performance 20dBi antenna allows long distance links and signal stability.

The antenna's ground plate has four stand-offs for an easy and fast installation of the electronic boards.
(fitting Mikrotik RB)

A Pigtail with U.fl connector and 14cm RG178U cable is integrated with the antenna.





MikroTik
Competence and training center



Thank You

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