HOW TO TURN ADSL ROUTER IN UMTS ROUTER

HLCz

edited by Kamaleonte

translated by Wanda M

The purpose of the guide is to transform an adsl router in a router umts wi-fi, so you have many PC online with a single internet key; in the proof the router is "alice gate voip 2 plus wi-fi " .

Topics :

- **necessary**
- **downloads**
- **installation part A**
- **connection of data cable**
- **installation part B**
- **installation of additional packages**
- **demonstration video**.

0. Necessary :

- internet key (every operator)
- GNU/Linux distribution
- ethernet cable (also ethernet crossover cable it's fine)
- rs232 cable (it's useful in 50% of cases)

1. Donwload :

In http://openwrt.org there is a list of routers supported by OpenWrt (Linux distribution for embedded devices), and for each router there is the image file to download; in the example for router "alice gate voip 2 plus wi-fi" there is this file openwrt-AGV2%2bW-jffs2-128k-cfe.bin

2. Installation part A :

You open the browser, visit the web page of the router "192.168.1.1" and look for the UPDATE button; if the button is there, you choose as firmware the just downloaded file and for next steps you must jump to 5th step of this guide; but if nothing happens or update button isn't there, you must use serial cable.
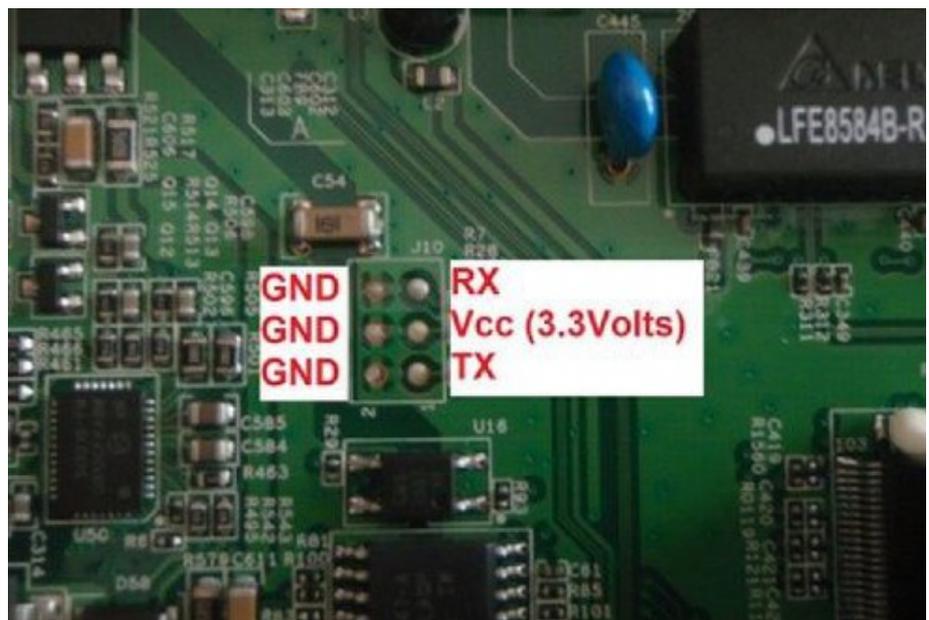
3. Connection of data cable :
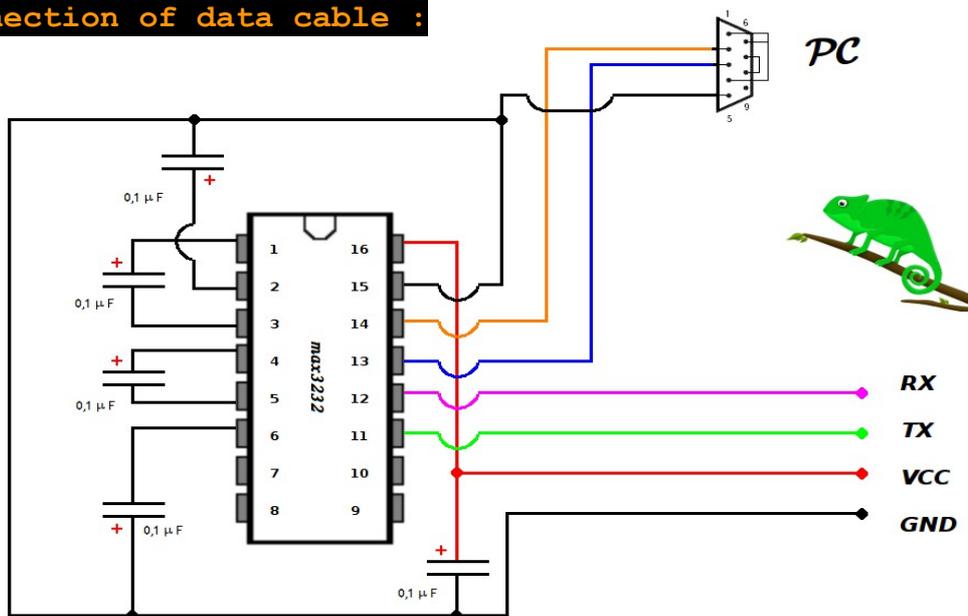
If you don't have a serial data cable, you can build it in according to the circuit diagram shown in the picture. The information transmitted is the logic state 1 or 0, the circuit translates the logic state 1 of 5 volt, in logic state 1 of 3Volt. For dimostraction I used a data cable of a mobile phone : "**Nokia CA-42**" data cable.
Found the cable and opened the router, in the point where red arrow is indicated in the picture, you must connect data cable.

The wires should be connected as in the picture:

- TX cable must be connected to RX of router

- Rx cable must be connected to TX of the router.

For to complete this step you need to install on your PC the program "*minicom*" (recommended) or "*cutecom*"
The connection parameters are: **155200 8N1**
In my case, since I use the data cable of phone, the door is /dev/ttyACM0.

If you use minicom, in the terminal you write the command "`minicom -D /dev/ttyACM0`"; if you use instead cutecom in appropriate field you always put as port `/dev/ttyACM0` .
You turn on the router and read what comes writing ; if something is written, the connection works; but if it doesn't work, you must try to reverse TX and RX or change the port, or turn off the router and re-open minicom / cutecom.

4. Installation part B :
You write in a terminal:

```
mkdir $HOME/temp
echo $HOME/temp
```

for example, the terminal returns

```
/home/sa/temp
```

with this commands, move inside the temp folder in your home the image file of openwrt already downloaded before:

```
sudo /etc/init.d/network-manager stop #fermiamo questo prog
sudo ifconfig eth0 192.168.1.100
sudo dnsmasq -d --enable-tftp --tftp-root=/home/sa/temp
```

Now you connect the serial cable, turn on the router and start minicom; then immediately press the Enter button so you can write in CFE (a kind of bootloader) :

help

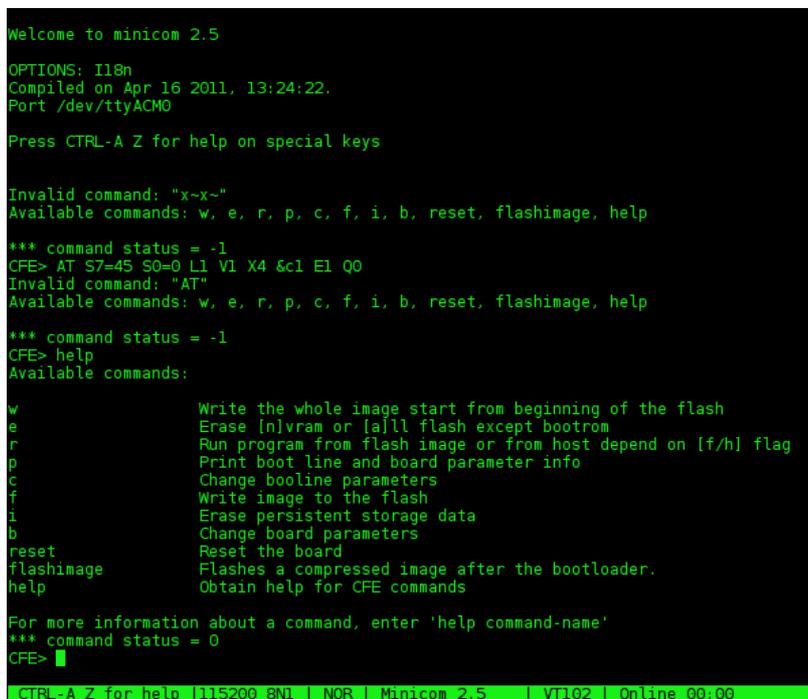This command shows all available commands, you must try the command "**flashimage**".
If you fail to enter into CFE, reboot the router without stopping the minicom program.

If there is the command "flashimage" as shown in picture, you are proceeding correctly and then you must write in terminal:


```
Welcome to minicom 2.5

OPTIONS: I18n
Compiled on Apr 16 2011, 13:24:22.
Port /dev/ttyACM0

Press CTRL-A Z for help on special keys


Invalid command: "x~x~"
Available commands: w, e, r, p, c, f, i, b, reset, flashimage, help

*** command status = -1
CFE> AT S7=45 S0=0 L1 V1 X4 &c1 E1 Q0
Invalid command: "AT"
Available commands: w, e, r, p, c, f, i, b, reset, flashimage, help

*** command status = -1
CFE> help
Available commands:

w               Write the whole image start from beginning of the flash
e               Erase [n]vram or [a]ll flash except bootrom
r               Run program from flash image or from host depend on [f/h] flag
p               Print boot line and board parameter info
c               Change booline parameters
f               Write image to the flash
i               Erase persistent storage data
b               Change board parameters
reset           Reset the board
flashimage      Flashes a compressed image after the bootloader.
help            Obtain help for CFE commands

For more information about a command, enter 'help command-name'
*** command status = 0
CFE>

CTRL-A Z for help |115200 8N1 | NOR | Minicom 2.5   | VT102 | Online 00:00
```

flashimage yourImageFile
in my case:

```
flashimage openwrt-AGV2+W-jffs2-128k-cfe.bin
```

5. Installation of additional packages :

To install software on the router you need to connect to internet and there are many alternatives, but in demonstration:

A: connect the router to the PC through network cable,
B: connect online your PC with internet key,
C: share the connection

the command are:
```
ifconfig eth0 192.168.1.100 netmask 255.255.255.0
iptables -t nat -A POSTROUTING -o ppp0 -j MASQUERADE
echo 1 > /proc/sys/net/ipv4/ip_forward
route del default
route add default dev ppp0

#dns temporanei
file=/etc/resolv.conf
echo "nameserver 208.67.222.222" > $file
echo "nameserver 208.67.220.220" >> $file
ping -c 4 www.google.it
```

for example the output is:
64 bytes from 173.194.32.24: seq=0 ttl=50 time=188.500 ms
64 bytes from 173.194.32.24: seq=1 ttl=50 time=117.938 ms

in the end I connect to the router with the command:
telnet 192.168.1.1 (or whit minicom and serial cable).

Now you must write on router:
```
vi /esegui
paste into the program that is open:
#-----------------------------------
file=/etc/resolv.conf
echo "nameserver 208.67.222.222" > $file
echo "nameserver 208.67.220.220" >> $file
route add default gw 192.168.1.100 dev br-lan
ping -c 2 www.google.it
#-----------------------------------
```

Save changes and write
```
chmod +x esegui #I make it executable
./esegui #I run it
```

if PC is online, the output is:
64 bytes from 173.194.32.24: seq=0 ttl=50 time=188.500 ms
64 bytes from 173.194.32.24: seq=1 ttl=50 time=117.938 ms

else you must control that cable is well inserted.

Install this program:

```
opkg update #scarica lista pacchetti
opkg install nano #editor di testo
opkg install kmod-usb2 kmod-usb-uhci kmod-usb-ohci
opkg install kmod-usb-serial kmod-usb-serial-option kmod-usb-serial-wwan
opkg install usb-modeswitch usb-modeswitch-data
opkg install chat comgt luci-proto-3g luci luci-ssl luci-i18n-italian
opkg install kmod-fs-ext4
opkg install kmod-fs-isofs kmod-fs-reiserfs kmod-fs-vfat kmod-fs-msdos
opkg install kmod-fs-nfs kmod-fs-xfs kmod-usb2
opkg install kmod-usb-storage kmod-usb-storage-extras block-mount hotplug2
opkg install luci-app-ddns luci-app-samba
opkg install iptables-mod-conntrack-extra
opkg install iptables-mod-filter
opkg install iptables-mod-ipopt
opkg install miniupnpd
```

It's need to use this command in PC-terminal for specify to router who is the internet key: `lsusb`

For example the output PC is:

```
Bus 001 Device 005: ID 12d1:1444 Huawei Technologies Co., Ltd.
```

For router:

```
echo "usbserial vendor=0x12d1 product=0x1444" > /etc/modules.d/60-usb-serial
```

For to enable:

```
/etc/init.d/uhttpd enable
/etc/init.d/uhttpd start
/etc/init.d/miniupnpd enable
/etc/init.d/miniupnpd start
```

In the end choose a password:

```
passwd root
reboot
```

Now restart the PC and open the browser at web page "192.168.1.1" it should look something ...
From the page that opens we can configure the wireless, the USB key inserted into the USB port of the router and much more.

Video :

- video 1 shows the installation of image file
- video 2 shows how to configure the key on the router for the connection.

For more information:

http://hacklab.cz