

OpenUMTS Manual

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USRP Hardware Driver

Linux:

```
sudo apt-get install libuhd-dev libuhd003 uhd-host
```

Mac:

```
sudo port install uhd
```

Windows Installers:

http://files.ettus.com/binaries/uhd/latest_release/

USB UHD driver:

http://files.ettus.com/binaries/misc/erllc_uhd_winusb_driver.zip

Command to find connected devices:

```
uhd_find_devices
```

Properties of attached device:

```
uhd_usrp_probe
```

USRP Technical Specifications:

<http://www.ni.com/pdf/manuals/374925c.pdf>

OpenUMTS Installation

Source:

<https://github.com/RangeNetworks/OpenBTS-UMTS>

Dependencies:

```
sudo apt-get install libreadline6 libreadline6-dev libosip2-dev
```

Prerequisites:

We also need ASN.1 C compiler that turns the formal ASN.1 specifications into the C code.

```
https://github.com/vlm/asn1c.git
```

OpenBTS uses the `coredumper` shared library to produce meaningful debugging information if OpenBTS crashes:

```
git clone https://github.com/RangeNetworks/libcoredumper.git
cd libcoredumper
sudo ./build.sh
sudo dpkg -i libcoredumper1_1.2.1-1_amd64.deb libcoredumper-
dev_1.2.1-1_amd64.deb
```

OpenUMTS

```
$ git clone https://github.com/RangeNetworks/OpenBTS-UMTS
$ cd OpenBTS-UMTS
$ git submodule init
$ git submodule update
$ sudo NodeManager/install_libzmq.sh
$ ./autogen.sh
$ ./configure
$ make
$ sudo make install
```

To setup OpenBTS-UMTS, we may need to modify the settings such as ARFCN, DNS, Firewall. Navigate to `~/OpenBTS-UMTS/apps` folder and open `OpenBTS-UMTS.example.sql` file with the preferable text editor. You may need to edit following options:

- **'GGSN.DNS'** set to **'8.8.8.8'** to enable Google DNS.
- **'GGSN.Firewall.Enable'** set to **'0'** to disable Firewall.
- **'UMTS.Radio.Band'** – set the band you are going to use [1].
- **'UMTS.Radio.CO'** – set the **UARFCN** [2].

Now, we need to create folders and working database:

```
$ sudo mkdir /var/log/OpenBTS-UMTS
$ cd /etc/OpenBTS
$ sudo sqlite3 /etc/OpenBTS/OpenBTS-UMTS.db ".read OpenBTS-UMTS.example.sql"
$ sudo cp TransceiverUHD/transceiver ~/OpenBTS-UMTS/
$ sudo cp TransceiverUHD/transceiver apps
```

We also need to setup forwarding in iptables to properly forward data between devices, host machine, and the Internet:

```
$ sudo su
$ iptables -t nat -A POSTROUTING -j MASQUERADE -o eth0
$ echo 1 > /proc/sys/net/ipv4/ip_forward
$ exit
```

If you have Internet connection through the another interface (for example, Wi-Fi), you need to change `eth0` to the applicable one (i.e., `wlan0`). Please note, that you need to setup forwarding in iptables every time after you computer rebooted.

It's important to install Subscriber Registry API and SIP Authentication Server to be able to launch OpenBTS-UMTS. Subscriber Registry controls database of subscriber information and in fact works as HLR (Home Location Registry):

```
$ git clone https://github.com/RangeNetworks/subscriberRegistry.git
$ cd subscriberRegistry
$ git submodule init
$ git submodule update
$ sudo NodeManager/install_libzmq.sh
$ autoreconf -i
$ ./configure
$ make
$ sudo make install
$ sudo mkdir /var/lib/asterisk/
$ sudo mkdir /var/lib/asterisk/sqlite3dir/
$ sudo cp apps/compl28 ~/OpenBTS-UMTS/
$ sudo cp apps/compl28 ~/OpenBTS-UMTS/apps/
$ sudo cp apps/compl28 /OpenBTS
```

Let's run OpenBTS-UMTS and Subscriber Registry:

```
$ cd OpenBTS-UMTS/apps
$ sudo ./OpenBTS-UMTS
$ cd subscriberRegistry/apps
$ sudo ./sipauthserve
```

References

[1] UMTS Frequencies (Spain) - https://wiki.bandaancha.st/Frecuencias_telefon%C3%ADa_m%C3%B3vil

[2] UARFCN Calc. - http://niviuk.free.fr/umts_band.php