SrsRAN Cellphone Network Radio

From user's Wiki!

Contents

VMWare Configuration

- Set USB controller to:

```
3.1
```

Installation from source code (needed in case of unsupported SDR like LimeSDR Mini)

Dependencies

- Ubuntu 18.04.5 LTS
- Build-essential:

```
sudo apt-get install build-essential -y
```

- Git:

```
sudo apt install git -y
```

- CMake:

```
sudo apt install cmake  -y
```

- C++

```
sudo apt-get install clang  -y
```

- Python libs:

```
sudo apt install libpython-dev python-numpy swig  -y
```

- Various:

```
sudo apt install libi2c-dev libusb-1.0-0-dev git g++ cmake libsqlite3-dev libwxgtk3.0-dev freeglut3-dev  -y
```

- Photos:

```
git clone https://github.com/pothosware/lms-rtl-sdr.git
cd lms-rtl-sdr/
mkdir build
cd build
cmake ..
make
```

  - Troubleshooting, the version cloned has a bug:

```
librtlsdr.so.0.5git: undefined reference to `LMS_EnableCalibCache'
collect2: error: ld returned 1 exit status
src/CMakeFiles/rtl_power.dir/build.make:97: recipe for target 'src/rtl_power' failed
make[2]: *** [src/rtl_power] Error 1
```

to solve the problem, find out that symbol in the source files:

```
find .. -type f -exec grep -l LMS_EnableCalibCache {} \;
```

```
../src/librtlsdr.c
```

then edit the file, changing that symbol with **LMS_EnableCache** :

```
vi ../src/librtlsdr.c
```

- - Complete the installation:

```
sudo make install
sudo ldconfig
```

- SoapySDR

```
git clone https://github.com/pothosware/SoapySDR.git
cd SoapySDR/
mkdir build
cd build
cmake ../
make
sudo make install
sudo ldconfig
```

- LimeSuite:

```
git clone https://github.com/myriadrf/LimeSuite.git
cd LimeSuite/
git checkout stable
mkdir builddir
cd builddir
cmake ../
make -j 2
sudo make install
sudo ldconfig
cd ../udev-rules
sudo bash install.sh
```

Testing Drivers

- Launch this command:

```
SoapySDRUtil --info
```

```
######################################################
##     Soapy SDR -- the SDR abstraction library     ##
######################################################

Lib Version: v0.8.1-g6ff969ef
API Version: v0.8.0
ABI Version: v0.8
Install root: /usr/local
Search path:  /usr/local/lib/SoapySDR/modules0.8 (missing)
No modules found!
Available factories... No factories found!
Available converters...
 -  CF32 -> [CF32, CS16, CS8, CU16, CU8]
 -  CS16 -> [CF32, CS16, CS8, CU16, CU8]
 -  CS32 -> [CS32]
 -   CS8 -> [CF32, CS16, CS8, CU16, CU8]
 -  CU16 -> [CF32, CS16, CS8]
 -   CU8 -> [CF32, CS16, CS8]
 -   F32 -> [F32, S16, S8, U16, U8]
 -   S16 -> [F32, S16, S8, U16, U8]
 -   S32 -> [S32]
 -    S8 -> [F32, S16, S8, U16, U8]
 -   U16 -> [F32, S16, S8]
 -    U8 -> [F32, S16, S8]
```

- Test LimeSDR Mini
    - Connect a LimeSDR Mini
    - Check if the device is seen and if it works in USB 3.1 mode:

```
lsusb
... omissis ...
Bus 004 Device 002: ID 0403:601f Future Technology Devices International, Ltd
```

```
lsusb -D /dev/usb/bus/004/002
... omissis ...
bcdUSB               3.10
... omissis ...
```

- - Launch the command:

```
SoapySDRUtil --probe
```

```
######################################################
##     Soapy SDR -- the SDR abstraction library     ##
######################################################

Probe device
[INFO] Make connection: 'LimeSDR Mini [USB 3.0] 1D53891D60912C'
[INFO] Reference clock 40.00 MHz
[INFO] Device name: LimeSDR-Mini
[INFO] Reference: 40 MHz
[INFO] LMS7002M register cache: Disabled

----------------------------------------------------
-- Device identification
----------------------------------------------------
  driver=FT601
```

```
hardware=LimeSDR-Mini
boardSerialNumber=0x1d53891d60912c
firmwareVersion=6
gatewareVersion=1.30
hardwareVersion=2
protocolVersion=1
... omissis ...
```

LimeSDR Firmware Updating

- Checking:

```
LimeUtil --find
```

  - Update:

```
LimeUtil --update
```

SrsRan

- Dependecies:

```
sudo apt-get install libfftw3-dev libmbedtls-dev libboost-program-options-dev libconfig++-dev libsctp-dev  -y
```

  - Source code downloading and compiling:

```
git clone https://github.com/srsLTE/srsLTE.git
cd srsLTE
mkdir build
cd build
cmake ../
make -j 2
sudo make install
sudo ldconfig
srsran_install_configs.sh  user
```

Configuration

LimeSDR Mini

  - **Note**: they are changing the application name, so the configuration directory wasn't ~/.config/srslte/ as expected, but ~/.config/srsran/

In the file ~/.config/srsran/enb.conf change the [rf] section in this way:

```
[rf]
dl_earfcn = 3050
tx_gain = 56
rx_gain = 38

device_name = soapy
device_args = rxant=LNAH,txant=BAND2
time_adv_nsamples = 70
```

Installation from binaries

Dependencies

- Photos:

```
sudo add-apt-repository -y ppa:pothosware/framework
sudo add-apt-repository -y ppa:pothosware/support
sudo apt-get update
sudo apt-get install  python3-pothos pothos-python-dev -y
```

  - SoapySDR - part 1

```
sudo apt-get install soapysdr-tools python-soapysdr python-numpy python3-soapysdr python3-numpy soapysdr-module-remote soapyremote-server -y
```

  - LimeSDR Drivers:

```
sudo add-apt-repository -y ppa:myriadrf/drivers
sudo apt-get update
sudo apt-get install soapysdr-tools python-soapysdr python-numpy python3-soapysdr python3-numpy soapysdr-module-remote soapysdr-server soapysdr-module-all -y
```

  - SoapySDR - part 2

```
sudo apt-get install soapysdr soapysdr-module-lms7 -y
```

SrsRan

```
sudo add-apt-repository ppa:softwareradiosystems/srsran
```

```
sudo apt-get update
sudo apt-get install srslte -y
sudo apt-get install srslte-dev
```

- **Note**: apparently, the packages was renamed, the command indicated in the official documentation:

```
sudo apt-get install srsran -y
```

is **wrong**. The same error appear in some other steps of official documentation.

Starting Services

- start the following command in two different terminals, in this order:

```
sudo srsepc
sudo srsenb --expert.lte_sample_rates=true
```

Starting UE

```
sudo srsue --expert.lte_sample_rates=true
```

Author

GBonacini - 2021 - Ver 0.4

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