Installing OpenBTS and GnuRadio with Fedora Core 11

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This guide is intended as a FC11-specific replacement to Sections 5 and 6 of Alex Loula's very helpful *OpenBTS Installation and Configuration Guide* posted to the openbts-discuss mailing list on 26 May 2009:

`https://sourceforge.net/mailarchive/forum.php?thread_name=aa0501a80905260808p1c806bbaxb63d419a2ae54a89%40mail.gmail.com&forum_name=openbts-discuss`

I. GnuRadio Installation

After installing Fedora Core 11, install the dependencies:

```
$ yum groupinstall "Engineering and Scientific" "Development Tools"
$ yum install fftw-devel cppunit-devel wxPython-devel libusb-devel \
  guile boost-devel alsa-lib-devel numpy gsl-devel python-devel pygsl \
  python-cheetah python-lxml
$ yum install comedilib
```

The USRP library requires the Small Device C Compiler (sdcc) package. **Do not** download **sdcc** using yum or from a rpm repository. Instead, grab the latest sdcc source tarball from:
`http://sdcc.sourceforge.net/snap.php#Source`

```
$ tar xvf sdcc-src-20090613-5467.tar.bz2
$ cd sdcc
$ ./configure
$ make
$ sudo make install
```

Installing `gnuradio` and `usrp` via `yum install` appears to succeed with FC11, but I couldn't for the life of me find the installed binaries. They certainly weren't in `/usr/local/lib`. Plan B: build gnuradio from source.

Do not download the gnuradio source tarball from the svn archive. Instead, download the FC11 source RPM from:
`ftp://download.fedora.redhat.com/pub/fedora/linux/development/source/SRPMS/gnuradio-3.1.3-5.fc11.src.rpm`

Now install the source rpm:

```
$ sudo rpm –iv gnuradio-3.1.3-5.fc11.src.rpm
$ cd /root/rpmbuild/SOURCES
```

You must apply the patches before attempting to build Gnuradio. FC11 includes GCC v. 4.4, which imposes more draconian requirements regarding the inclusion of standard header files in C/C++ source code.

```
$ tar xvf gnuradio-3.1.3.tar.gz
```

```
$ patch –p0 < gnuradio-3.1.3-gcc44.patch
$ patch –p0 < gnuradio-3.1.3-comedilib0.8.patch
$ patch –p0 < gnuradio-3.1.3-werror.patch
```

OK, now it's safe to attempt to build gnuradio. But first, set the `PYTHONPATH` environment variable ($ python –V to verify your Python version). Then, delete the `aclocal.m4 file` in order to avoid a mysterious `libtool` version incompatibility error. It's a good idea to add these two environment variable definitions to your `.bash_profile`.

```
$ cd gnuradio-3.1.3
$ export PATH=$PATH:/usr/libexec/sdcc
$ export PYTHONPATH=/usr/local/lib/python2.6/site-packages
$ rm aclocal.m4
$ ./configure –with-boost-include-dir=/usr/include/boost/
$ make
$ make check
$ sudo make install
```

Verify that `libusrp` is installed in /usr/local/lib and that there's a `usrp.pc` file in `/usr/local/lib/pkgconfig`.

II. OpenBTS Installation

Install asterisk, libosip2:

```
$ yum install asterisk libosip2
```

Download the oRTP library from: `http://freshmeat.net/projects/ortp/`

```
$ tar xvf otrp-0.15.0.tar.gz
$ cd ortp-0.15.0
$ ./configure
$ make
$ sudo make install
```

The next steps assume that you have gotten the tarball for the OpenBTS v. 2.3 (Jean LaFitte) distribution from Kestrel Signal processing. You must set the `PKG_CONFIG_PATH` environment variable so that OpenBTS can find `libusrp.so`.

```
$ tar xvf openbts-2.3JeanLaFitteOE.tar.gz
$ mv openbts-2.3JeanLaFitte openbts-2.3
$ cd openbts-2.3
$ export PKG_CONFIG_PATH=/usr/local/lib/pkgconfig
```

OpenBTS includes some non-GCC v. 4.4 source files. I'm no Linux hacker, so I ended up adding the necessary `#include` statements by hand. Presumably, these files will be patched in the future.

In `openbts-2.3/CommonLibs`:

```
Timeval.h:  #include <stdint.h>
Sockets.cpp : #include <cstdio>
Logger.cpp : #include <cstdio>
```

In openbts-2.3/SMS:

```
SMSMessages.cpp: #include <cstdio>
```

In openbts-2.3/Transceiver:

```
Transceiver.cpp:  #include <cstdio>
USRPDevice.cpp: #include <cstdio>
                #include <stdin.h>
```

In openbts-2.3/apps:

```
sendSimple.cpp: #include <cstdio>
```

Now you should be ready to build OpenBTS:

```
$ ./configure
$ make
$ sudo make install
```

VOILÀ!