The GNU Radio Toolkit

Martin Braun, Ettus Research

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Outline

1. Installation
2. Resources
3. Starting to Code
4. Becoming a Developer
5. The Community
Top 4 easiest ways to install GNU Radio

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2. `apt-get install gnuradio` — use your package manager, Synaptic or whatever
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4. Source Builds
PyBOMBS — The apt-get of GNU Radio

- Installs GNU Radio, Hardware Drivers and OOTs for you!
- Sets up environment variables etc. for you!
- Available at: http://gnuradio.org/pybombs
- Modules are added by PyBOMBS maintainers in form of lightweight recipes
- PyBOMBS 2.0 just released!
PyBOMBS 2.0

Still Fresh

New Features:
- Installable
- Multiple prefixes, each with its own configuration
- Multiple recipe remotes, per system, per user or per prefix
- Easy cross-compiling

Action happening at:
github.com/gnuradio/pybombs
Source Builds

Useful for development on GNU Radio itself

Requirements:

1. Install all dependencies (Boost, UHD, QT, …)
2. Run `cmake && make && make install`
3. Et Voilà! You’re done! (or not)
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(Martin Braun, Ettus Research)
GNU Radio Companion

- Graphical front-end for GNU Radio (its face)
- Powerful graphical widgets for live inspection of signals/data
- Ignore GRC at your own peril
CGRAN

- http://cgran.org
- Spiritual Cousin of CTAN, CPAN…
- Recently rewritten by the CGRAN Special Forces (main contributors: Nathan + Ravi)
- Easy access to the entire free & open software radio ecosystem
- Automatically generated website listing most OOT modules
- Between CGRAN and PyBOMBS, finding and installing modules should be a simple task
First Steps: Guided Tutorials

- Gentle introduction to GNU Radio (and even some DSP)
- Find these online on our wiki
- Comes with a free set of codes: gr-tutorial
Where do I learn about these blocks?

- Read our fine manual!
  - [http://gnuradio.org/doc/](http://gnuradio.org/doc/)
- All blocks are browsable through several paths, and searchable
- GRC provides docs, too
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(Martin Braun, Ettus Research)
gr_modtool — The Swiss Army Knife of modules

- Modify and create your OOTs from the command line
  - Unfortunately, only the command line at this time
- Create, remove, disable, enable blocks
- Never write any boilerplate code again!
Writing blocks: A core skill of developing SDR

- `gr_modtool` tries to make this as easy as possible
- Languages available:
  - Python, for fast & easy dev
  - C++, for highest performance
Where do I learn how to use all these blocks?

- Where do I learn how to do all this wireless communications stuff?
- Which codez do I put into my
  <+ do signal processing here +>?
Getting Help — Interacting with other People

- discuss-gnuradio, usrp-users mailing lists
- Very responsive!
- IRC: #gnuradio on Freenode
- Join the discussions!
- But first, read the wiki page on reporting errors, etc.!
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You’ve found a bug? Something’s bothering you?
Fix it!
- Actual bugs
- Missing features
- Bad docs
- Unintuitive coding
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There’s a big community, join it!

Buy shirts: gnuradio.spreadshirt.de

There’s the conference, and also local meetings, hackfests...
Conclusion

- SDR is a very hard topic
- But GNU Radio is there to make it easier
- Getting started with GNU Radio, writing first blocks etc. is well documented at this point
  - (and if it’s not, maybe you can help us improve it!)
- And after that, we have a great community