

# PyBOMBS & CGRAN — An Update

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# CGRAN: A Reminder, and a preview

- Where can you find all the incredible GNU Radio projects?
- `www.cgran.org`
- As a project maintainer, your project could be listed here!
- Coming soon: `pybombs-protocol` will auto-install modules

# Outline

- 1 Installing GNU Radio and OOTs
- 2 PyBOMBS concepts
- 3 Out-of-tree Modules
- 4 Conclusion

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- 3 PyBOMBS (Version 2!)
- 4 Source Builds



# PyBOMBS: What you will need

- A Linux or Mac box (one day we'll have Windows covered, but not today)
- Fedora, Ubuntu, CentOS, Debian, and probably many other distros fine
- Python 2.7



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- And what else...

# PyBOMBS: What you will need

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- Fedora, Ubuntu, CentOS, Debian, and probably many other distros fine
- Python 2.7
- And what else...
- Nope, that's it! (Maybe some hardware?)

# Getting started with PyBOMBS

- Install PyBOMBS: `pip install pybombs`
- Optionally install PyBOMBS GUI: `pip install pybombs-gtgui`
- Install recipes:

```
$ pybombs recipes add gr-recipes  
git+https://github.com/gnuradio/gr-recipes.git  
$ pybombs recipes add gr-etccetera  
git+https://github.com/gnuradio/gr-etccetera.git
```
- Now let's install GNU Radio and all dependencies:
- `pybombs prefix init -a default -R gnuradio-default /home/mbr0wn/prefix/gnuradio`

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## Why do I need a *prefix*?

- Standard Unix way (since probably even Marcus Leech started) is to install software either into `/usr` or `/usr/local`.
- Self-compiled software would default into the latter
- This is simple and understood, but has some problems:
  - No standard way to uninstall hand-installed software
  - Only one installation at a time possible
  - Requires admin (sudo) privileges
- So how about we install it into some random directory in our home?
- `/home/mbr0wn/prefix/gnuradio` — The prefix!
- Solves all the problems above, except we now need to tell the system where to look for stuff (*environment variables* need setting)

# What makes a PyBOMBS prefix special?

- May have a `.pybombs` subdirectory, which stores local special configurations.
- All config files are YAML format.
- Use `pybombs prefix init` to create the prefix directory.

## pybombs prefix init

- Show me that command again:

```
pybombs  
prefix init  
--alias default  
--recipe gnuradio-default  
/home/mbr0wn/prefix/gnuradio
```

- Aah, I get it now. We install into `prefix/gnuradio`, and we use the rules defined in `gnuradio-default`.
- We call such definitions a *recipe*.

## So... recipes?

- Remember the `pybombs recipe add` commands?
- These are part of most people's installation. (See PyBOMBS manual).
- Will install all default recipes.
- Let's take a quick look at one of those.
- Like all PyBOMBS config files, in YAML format.



# How do I install things then?

- `pybombs install [-p PREFIX ] PACKAGE`
- Let me show you.
- `PREFIX` is either an alias, or a full path.

## And how do I run GNU Radio now?

- First, initialize your prefix of choice:
- `source $PREFIX/setup_env.sh`
- You're good. Run: `gnuradio-companion` if you don't believe me.
- You can initialize any number of prefixes at once (only one per shell, though).
- Clicky launchers also work fine.

# Why is PyBOMBS accessing my system?

- PyBOMBS is not a container replacement.
- It will use any means to get your system ready to build software (e.g., GNU Radio).
- Your system's package manager is one of those means.
- It might need elevated privileges. This is normal.
- Here's a nice trick: `pybombs install --deps-only gnuradio`

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# Out-of-tree Modules

- GNU Radio comes with a lot of blocks, but a lot of the value comes from the ability to extend it.
- Other people like to share their extensions to GNU Radio!
- If they're particularly awesome, they're on `www.cgran.org`!
- Side note: Making OOTs is really easy. Just use `gr_modtool`!
- See:  
`gnuradio.org/redmine/projects/gnuradio/wiki/Guid`

# PSA for content producers

- If you're a producer of GNU Radio-related products or projects, listen up!
- Please consider using PyBOMBS.
- We're trying to consolidate installation methods.
- Create your own recipe repository if you have anything else than a single standard recipe.
- Include manifests in your OOTs so we can source them for CGRAN.

# SDKs/Cross-compiling with PyBOMBS

- PyBOMBS for embedded devices is (fairly) well supported
- ... if the recipes exist
- Just FYI: PyBOMBS method conflicts with what some embedded people think is the right way to go

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# FAQ

- Q: Why not just use the package manager?  
A: You can use both. PyBOMBS will give you the most up-to-date code, and works for most OOTs.
- Q: Can't I just do this all by hand?  
A: Knock yourself out!
- Q: Will PyBOMBS help me cross-compile? A: It'll basically do all the work for you—if you have proper recipes.
- Q: Will you make PyBOMBS work on my system/OS? A: Yes, by gladly accepting your patches!
- Q: Bugfixes/contributions? A: github!
- Q: Why didn't you use an existing tool instead of writing PyBOMBS? A: Many good reasons.

# Conclusion

- PyBOMBS is awesome and can save you time.
- Sysadmin-friendly (I believe).
- All our cool stuff is on CGRAN. You want to be on CGRAN, too.
- Thanks to all contributors, users and bugfixers!