GNU Radio in 2019: Facts and Plans

An overview of where GNU Radio is going this fine year

Marcus Müller

2018-09-18



What'll happen in the next 40 minutes

Looking back at 5 years of 3.7

What has happened to 3.7?

Releasing GNU Radio 3.8

3.8.0.0+ and beyond

Conclusion

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Bearer of a couple of roles

- Ettus P Research
- Support Grumpiness supplier
- ► Research assistant at
- Karlsruher Institut für Technologie
- ▶ I hold the exercise classes for KIT EEs' *Probability Theory* and *Communications Theory* courses (> 300 students) and *Applied Information Theory* (ca 13 dB fewer students)
- ► Freelancing Engineer
 - ► Technical Consulting
 - ► Contract Development
 - Seminars
- ► Chief Architect of the GNU Radio project

Marcus Müller

Contact

Depending on what you want to talk to me about, contact me using

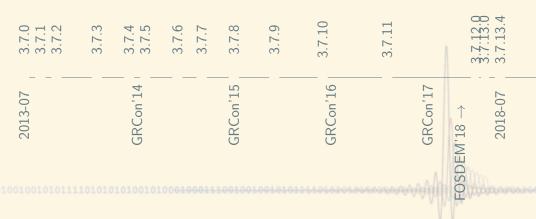
- ▶ University Research & Teaching: mueller@kit.edu
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- ► Freelancing & Private: mueller@hostalia.de



State of GNU Radio 2019

GNU Radio 3.7 released June 2013

next branch forked off at that point



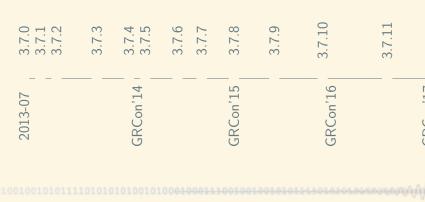
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→ tbd

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tbd FOSDEM'19 → **ASAF**

What has happened to 3.7 since FOSDEM'18?

New versioning scheme: Semantic Versioning (https://semver.org) Formalized CHANGEL OG format

New development model

- ▶ Development happens on master, bugfixes backported to maint-3.7
- next has been merged into master
- ▶ 3.8.0.0 will be tagged off master
- ▶ 3.7.x.x is tagged off maint-3.7

Retirement of maint, mergeback model

What will happen to the 3.7 series?

Stability & Maintenance

3.7 has been around for 5 years, with long stagnant periods

Lot of undocumented behaviour becoming implicit API

3.8 simply is different (in good ways)

▶ long-term commitment to support 3.7 on longer-term platforms (Debian stable, RHEL/CentOS, Ubuntu 16.04LTS)

But:

▶ No C++11, Python3, ... for 3.7.x.x: You probably won't want to compile GNU Radio 3.7.13.4 on your bleeding edge Linux distro in a couple of years

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What's to come in GNU Radio 3.8?

Innovation and Future-Proofing

- ▶ Dependency cleanup: No choice, lots of benefits
 - ightharpoonup Qt4 ightharpoonup Qt5
 - ► •Cheetah/XML → YAML
 - ▶ •log4cpp → own logging system
- ► Language progression
 - ► •Py2 → Py2.7 OR Py3
 - ightharpoonup igh
- Removed components
- ► New functionality
 - ► Better gr_modtool (shoutout to Swapnil!)
 - ► C++ code generation (shoutout to Håkon)
 - ► Overall cooler GRC



Releasing 3.8

When will we release 3.8?

When it's ready.

I promise it no to be a minute later, but also not a (very expensive) hour early. We're currently in a feature freeze to really focus on releasing 3.8. Blockers:

- ► Modern CMake
- ▶ •new OOT template (depends on modern CMake)
- ▶ •logging system
- ► •open bugs
- at least rudimentary documentation
- \longrightarrow https://github.com/gnuradio/gnuradio/projects/1

3.8 Release Procedure

- 1. Get the blockers sorted out
- 2. Tag RC1
- 3. Create Binary packages, spread
- 4. Fix blocking bugs that come up
- 5. Automated whole-tree code formatting
- 6. Release RC2, update binary packages
- 7. Give it 10 workdays to find remaining breakage
- 8. Tag, sign, and release 3.8.0.0
- 9. Party.

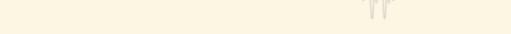
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What'll do once we've released 3.8?

- 3.8.x.x development continues on the maint-3.8 branch
 - ► Bugs happen, let's fix them

Feature development mainly on master → 3.9

3.7.13.4++ needs to be maintained, too.



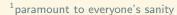
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Kicking off 3.9 development

Whole-tree code formatting officially terminates feature freeze

Use 3.8 as stepping stone towards are more modern future ... without breaking everything at once

3.9 will not take another 5 years to be released ¹



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- ► GNU Radio should come with batteries included
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 - ---- upstream central infrastructure

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Be better

- ► Make Scheduler exchangeable
- ► Remove shared state between blocks, use RPC
- Actually write a new scheduler



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▶ Upstream:

- lacktriangledown gr-soapy will become part of GNU Radio ightarrow we'll "natively" support your favourite SDR
- ▶ gr-iio will support ADI, esp. on SoCs
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► Better ourselves:

- ► Have reliable RPC based on PMT successor + transparent transports
- ► Finally remove VOLK from the main tree and treat it as dependency

Conclusion

- ▶ 3.7 development has reached a matured state
- ▶ 3.7 will still be supported as long as the typical platforms it runs on
- ► 3.8 is coming *very* soonTM
 - ► C++11, Python3, Qt5, YAML
 - ► Cooler GRC, Code Generation, CMake
 - ▶ Want it faster? Fix some bugs!
- ▶ 3.9 is the next big thing
 - New upstreaming strategy

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