GNU Radio

GSoC – 2024 (175 hr)

By – Satya Prakash Sasini

Project under Proposal-

* CI for maintenance branches and selected OOT modules (CI improvements)

Table of Contents

* CI for maintenance branches and selected OOT modules (CI improvements)
* Problem Description
* Workflow of existing CI
* Deliverables
* Schedule
* Proof Of Coding Capabilities
* Formalities
* Acknowledgement Of Three Strikes Rules
* Contribution in GNU Radio

**CI for maintenance branches and selected OOT modules(CI improvements)**

**Problem Description:**

The current CI setup is taking longer to build due to building for every environment separately. This approach results in redundant builds for different platforms, significantly increasing the overall build time. Also implementing an efficient nightly builds for GNU Radio's maintenance branches and some select OOTs.

**Workflow Of Existing CI**

The existing CI workflow of GNU Radio accomplishes various tests, builds, checks, etc.

* **conda\_build.yml**

In this workflow on every ‘push’ or ‘pull request’, first there is a initial set up for matrix strategy, so that builds for multiple environment can be done, in a single workflow. Also archiving the ‘failed build artifact’ and their ‘build environment’ is also done for debugging purpose.

However, the build process for all different environment are included in a same workflow intended to not to trigger build for next environment if one fails, but due to this the whole time taken to complete the workflow is very long.

* **pkg-debina/fedora.yml**

The above two workflow i.e. pkg-debian.yml and pkg-fedora.yml are used to automates the packaging process for Debian-based distributions and Fedora-based distributions. There are separate package building script for both also.

However, there is no error handling done here. There should be some mechanism that could provide us with some logs in case of failures.

**Deliverables**

**Deliverable 0:** Implement parallelism in the existing CI workflow i.e. in the conda\_build.yml workflow file. The build for different environment will start simultaneously but will fail if anyone of the following fails.

**Deliverable 1:** Implement logging mechanism or error handling for any failure in packaging workflow.

**Deliverable 2:** Implement new workflow for PPA, Snaps and Flatpak apps which are to be triggered on specific situations

**Schedule**

Since I have a previous commitment as a full-time DevOps Intern in one Organisation, I m planning to give at least 20 hours a week. I will push myself to complete the project before September i.e. nearly towards end of August.

* Before Official Coding Period Starts
* Explore all the existing CI pipeline
* Understand the existing pipeline mechanism
* Explore flatpak apps
* Identifying the common dependencies
* Getting familiar with the GNU radio installation process in every environment
* May 27 – June 27
* Will identify common dependencies across all environments
* Implement parallelism all the build process of different environments
* June 27 – July 8
* Get the metrics for the build time and optimise them
* Establish interdependency between different environment’s workflow so that if any one build fails then the build for the next environment is not triggered
* July 13 – September 2
* Implement night build mechanism i.e. to build flatpack apps and snaps
* POC on updated CI pipeline
* Implement(with GitHub Action and required scripts to build) and test Flatpak apps and snaps for nightly builds with proper tags so that it will be easy to segregate the perfect he environment on the basis of a particular state of the repository
* Test the implementation and improve them

**Proof Of Coding Capabilities**

The whole GNU Radio project on the most basic levels needs C++, DSP (Digital Signal Processing ) and Python to be a contributor.

I happen to have had courses and experiences that pertains to these requirements in my engineering course and on-going internship so far. Namely

**College Course Works:**

* Data Structures and Algorithms using C++
* Operating System
* OOPs Using Java
* DLD (Digital Logic Design)
* DSP (Digital Signal Processing)
* DBMS (Database Management System)
* Theory Of Computation
* Programming in Python
* Software Engineering
* Computer Networks

Currently I m working as a DevOps intern in Devtron, due to company’s privacy issue I m unable share my contributions in it, but I can share my field of work, also I can share my GitHub account given by the organisation in which most of my contributions are into their private repo, but there area some of my demo projects there.

Company provided GitHub account link : [SATYAsasini](https://github.com/SATYAsasini)

**Internship Experiences So far:**

* Docker
* Kubernetes
* Helm
* GitHub Actions
* Scripting
* Automation (python)
* Kube-Prometheus-Stack

I have couple of projects in my personal GitHub account show casing my ability to code, also I m attaching some of my profiles from coding practice platforms like Leetcode and GeekForGeeks where I have solved number of problems in C++ language.

>Personal GitHub Account Link: [SWITCHin2](https://github.com/SWITCHin2)

>Leetcode: [satya\_sasini](https://leetcode.com/satya_sasini/)

>GeekForGeeks: [michikatsu\_kokushibo](https://auth.geeksforgeeks.org/user/michikatsu_kokushibo)

**Formalities**

* Hello! I am Satya Prakash Sasini a final year of the ongoing course Bachelor Of Technology in the field of Computer Science and Engineering from Trident Academy Of Technology, Bhubaneswar, Odisha, India.
* I would be residing in Gurugram, Haryana, India during Google Summer of Codes Program

**Time Zone**: (GMT + 5:30)

* Currently I am working in Devtron Inc. as DevOps Intern.
* GSoC has no connection with my university work.

Personal Details:

* Email: satya[sasini.39@gmail.com (personal)](mailto:sasini.39@gmail.com%20(personal))

[satya.prakash@devtron.ai (work](mailto:satya.prakash@devtron.ai%20(work) e-mail)

* Matrix ID: @satya\_sasini:gnuradio.org

Other Commitments during Summer:

* As currently I’m working as a DevOps intern, I will be spending first half of my day there and will continue to accomplish my GSoC related tasks once I get back from office.
* I will give 20 hours a week at least and push beyond to complete my project and it will be quite easy for me as my internship work field and chosen project are quite relevant.

How many hours per week do I plan to spend on solving the issues?

* I m willing to give my full dedication to accomplish my commitments as it resides with my interest and quite fascinating
* I will also keep track of all my works and post weekly blogs regarding my work
* Once, I get back from Office I can easily give 20+ hours a week to accomplish the above commitments.

**Acknowledgement Of Three Strikes Rule**

As an aspiring contributor to GNU Radio for GSoC 2024, I acknowledge the 3 strikes rule, failing of which shall have consequences including receiving warnings for missing weekly public updates, falling behind on promised deliverables, GPL/FLOSS license violations, engaging in abusive conduct such as using offensive language on mailing lists or IRC, and prioritizing other activities over GSoC commitments to an extent that it affects project progress.

**Contribution in GNU Radio**

* PR: <https://github.com/gnuradio/gnuradio/pull/7188#event-12140189641>

For a subtask mention in the issue: <https://github.com/gnuradio/gnuradio/issues/4765>

I would like to continue contributing to GNU Radio as the tech stacks used in GNU Radio seems interesting to me and also in my course of research for GSoC proposal I have a good majority of the code base, after GSoC I would like to contribute as into the functional aspect of the code base as I have hands on experience in both Python and C/C++

SECRET WORDS: Cyberspectrum is the best spectrum