



Contributing to EESSI



**university of
groningen**

center for
information technology

9th EasyBuild User Meeting 2024 (2024-04-25)

Pedro Santos Neves (RUG)

Who am I?

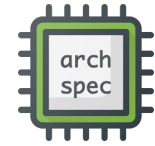
Pedro Santos Neves: Evolutionary Biologist from Portugal



- User support and software development at HPC Team - UGroningen since Sep 2023
- Active contributor to **EESSI**, partner in MultiXscale EuroHPC CoE
- Biology -> scientific programming -> HPC

Testing ReFrame

Software layer
Optimized applications + dependencies



Host OS provides network & GPU drivers, resource manager (Slurm), ...

Compatibility layer
Levelling the ground across client OSs



Filesystem layer
Distribution of the software stack



CernVM-FS

Host operating system

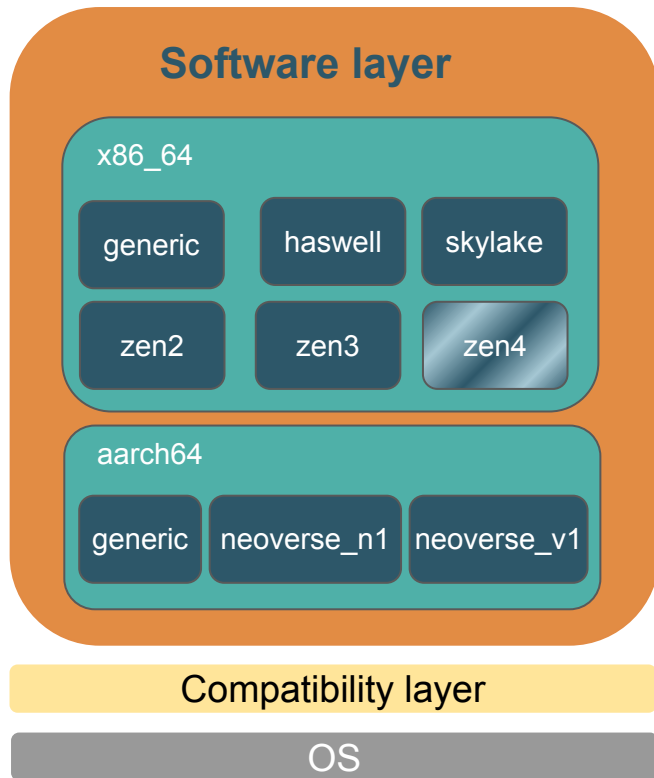
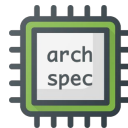


E E S S I
EUROPEAN ENVIRONMENT FOR
SCIENTIFIC SOFTWARE INSTALLATIONS

Software layer



Lmod

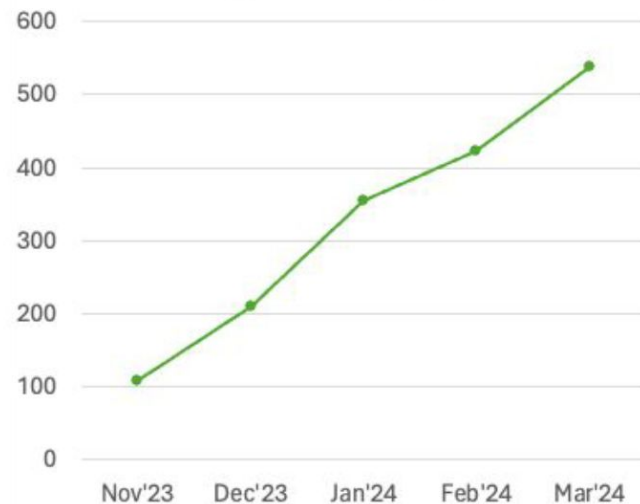


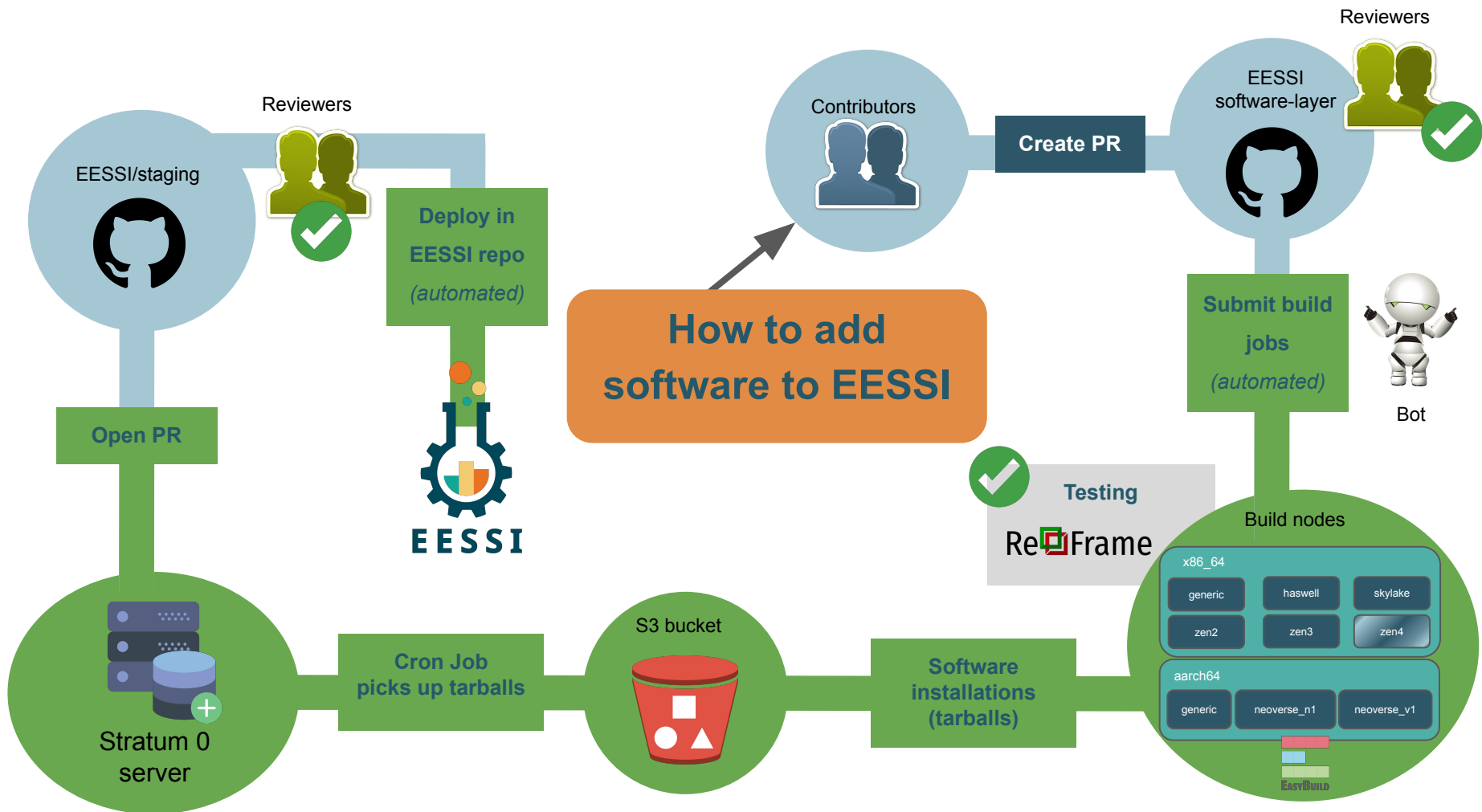
github.com/EESSI/software-layer

Overview of installed software

- 577 software software installations per CPU target and increasing
 - eessi.io/docs/available_software
(Coming soon!)
- Includes (**but is not limited to!**) applications specific to the MultiXscale CoE
- More recent toolchains: currently targeting foss-2023a to foss-2023b

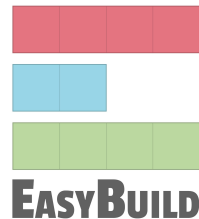
software installations in EESSI 2023.06
(per CPU target)





EESSI build environment 1/2

- EasyBuild configuration (`configure_easybuild` file)
 - Setup (compat layer, etc) requires specific configuration
 - `RPATH`
 - `sysroot`
 - `filter-deps`
 - `experimental`
- Build container (Debian 11)
- Easystack files
 - What software to build?
- EasyBuild hooks



EESSI build environment 2/2



`bot/build.sh`

`eessi_container.sh`

`run_in_compat_layer_env.sh`

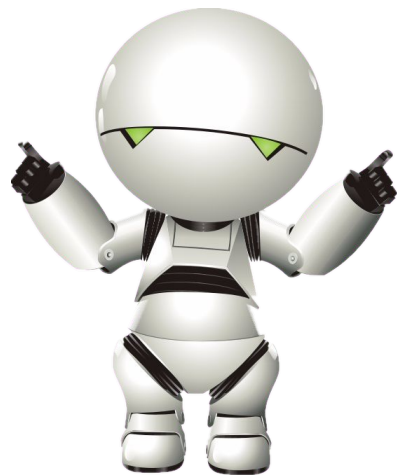


`EESSI-install-software.sh`

Build-test-deploy bot

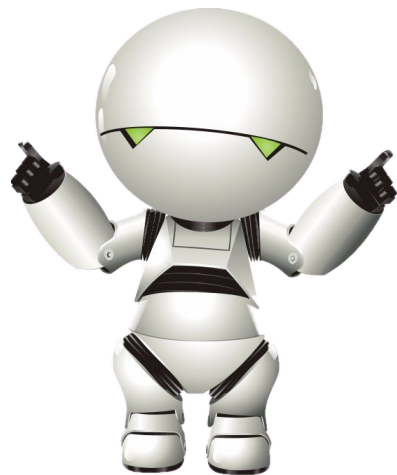
1/2

- GitHub App listening to PR events
- Pulls PR, triggers builds, checks installations
- Bot commands (permissions needed):
 - `bot: build repo:... arch:...`
 - `bot: deploy`
 - `bot: show_config`



Build-test-deploy bot

2/2



- Two instances running for EESSI in two cloud clusters:
 - AWS
 - Azure (zen4 WIP)
- Built to be “agnostic” to EESSI
 - Can be (and has been) ported to other contexts
- Event handler
 - Triggered by PRs, comments, writes comments
- Job handler
 - Reads slurm queue, starts jobs, reports back

Demo

github.com/EESSI/software-layer

The screenshot displays the GitHub interface for the repository `EESSI / software-layer`. The navigation bar includes icons for Code, Issues (89), Pull requests (19), Actions, Projects, Wiki, and a user profile. The 'Pull requests' tab is active and underlined. Below the navigation bar, there are filters (is:pr is:open), labels (24), and milestones (1). A green button labeled 'New pull request' is visible. The main content area shows a list of pull requests with columns for Author, Label, Projects, Milestones, Reviews, Assignee, and Sort. Two pull requests are visible:


- Remove `build_container.sh` script** ✓ (2 comments)
#544 opened 3 days ago by bedroge • Review required
- {2023.06}[foss/2023a] QuantumESPRESSO 7.3.1** ✗ (15 comments)
#535 opened 2 weeks ago by ocaisa • Review required



Community participation

- Software suite for radio astronomy
- Community request/collaboration via SURF (SKAO Regional Centre)

- PRs opened for EasyBuild
- Working out issues together
- Merged and deployed!

 EESSI /  EESSI support portal / Issues / #14

Request for installing radio astronomy software for SKA

 Closed  Issue created 6 months ago by Tim Kok

Software installation request

Personal details

Institution (optional): [SURF](#), working on a project exploring software distribution for the [SKA Regional Centres](#).

Detail of software

Software name (required):

- DP3 - 6.0 - <https://dp3.readthedocs.io/> - GPL-3.0-only
- WSClean - 3.4 - <https://wsclean.readthedocs.io/> - GPL-3.0-or-later
- AOFlogger - 3.4.0 - <https://aoflogger.readthedocs.io/> - GPL-3.0-only
- EveryBeam - 0.5.2 - <https://everybeam.readthedocs.io/> - GPL-3.0-only

Documentation + getting help

- Comprehensive documentation for users, **contributors** and maintainers.
- Detailed instructions on:
 - Adding new software
 - Getting help
 - Debugging failing builds
- Support portal
- EESSI Slack

eessi.io/docs/

eessi.io/docs/adding_software/

The screenshot shows a dark blue header with the EESSI logo on the left, a search bar in the center, and 'EESSI @ GitHub' with a repository icon and the number '20' on the right. The main content area has a left sidebar with navigation links: 'European Environment for Scientific Software Installations (EESSI)', 'Home', 'Project overview', 'Filesystem layer', 'Compatibility layer', 'Software layer' (highlighted in blue), and 'Test suite'. The main text area is titled 'Opening a pull request' and contains the following text: 'To add software to EESSI, you should go through the semi-automatic software installation procedure by:' followed by a bulleted list of four steps. The first step mentions a 'software-layer' repository and an 'easystack file' used by 'EasyBuild'. The second step involves instructing a 'bot' to build software on supported CPU microarchitectures. The third step involves instructing the 'bot' to deploy software for ingestion into the EESSI repository. The fourth step involves merging the pull request once CI indicates the software has been ingested, marked with a green checkmark. On the right side of the main content area, there is a 'Table of contents' section with links for 'Preparation' and 'Creating a pull request'.

European Environment for Scientific Software Installations (EESSI)

Home

Project overview

Filesystem layer >

Compatibility layer >

Software layer >

Test suite >

Opening a pull request

Search

EESSI @ GitHub 20

To add software to EESSI, you should go through the semi-automatic software installation procedure by:

- 1) Making a pull request to the [software-layer](#) repository to (add or) update an [easystack file](#) that is used by [EasyBuild](#) to install software;
- 2) Instructing the [bot](#) to build the software on all [supported CPU microarchitectures](#);
- 3) Instructing the [bot](#) to deploy the built software for ingestion into the EESSI repository;
- 4) Merging the pull request once CI indicates that the software has been ingested. ✓

Table of contents

Preparation

Creating a pull request

Ingestion step

Ingest eessi-2023.06-software-linux-x86_64-intel-skylake_avx512-1713253265.tar.gz #1172

Edit

<> Code

Merged

bedroge merged 2 commits into main from eessi-2023.06-software-linux-x86_64-intel-skylake_avx512-1713253265.tar.gz_approved last week

Conversation 0

Commits 2

Checks 0

Files changed 1

+0 -0



EESsIbot commented last week

A new tarball has been staged for [EESsI/software-layer#542](#). Please review the contents of this tarball carefully. Merging this PR will lead to automatic ingestion of the tarball.

► Metadata of tarball

▼ Overview of tarball contents

Total number of items in the tarball: 21

URL to the tarball: https://software.eessi.io-2023.06.s3.amazonaws.com/2023.06/software/linux/x86_64/intel/skylake_avx512/1713253265/eessi-2023.06-software-linux-x86_64-intel-skylake_avx512-1713253265.tar.gz

Full listing of the contents of the tarball:

```
2023.06/software/linux/x86_64/intel/skylake_avx512/modules/all/ncdu/1.18-GCC-12.3.0.lua
2023.06/software/linux/x86_64/intel/skylake_avx512/modules/tools/ncdu/1.18-GCC-12.3.0.lua
2023.06/software/linux/x86_64/intel/skylake_avx512/software/ncdu/1.18-GCC-12.3.0
2023.06/software/linux/x86_64/intel/skylake_avx512/software/ncdu/1.18-GCC-12.3.0/bin
2023.06/software/linux/x86_64/intel/skylake_avx512/software/ncdu/1.18-GCC-12.3.0/bin/ncdu
2023.06/software/linux/x86_64/intel/skylake_avx512/software/ncdu/1.18-GCC-12.3.0/easybuild
2023.06/software/linux/x86_64/intel/skylake_avx512/software/ncdu/1.18-GCC-12.3.0/easybuild/easybuild-ncdu-1.18
```

Reviewers

bedroge

Assignees

No one—[assign yourself](#)

Labels

None yet

Projects

None yet

Milestone

No milestone

Development

Acknowledgements

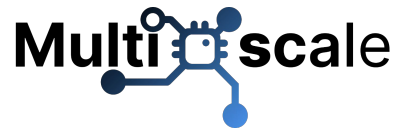


Co-funded by
the European Union



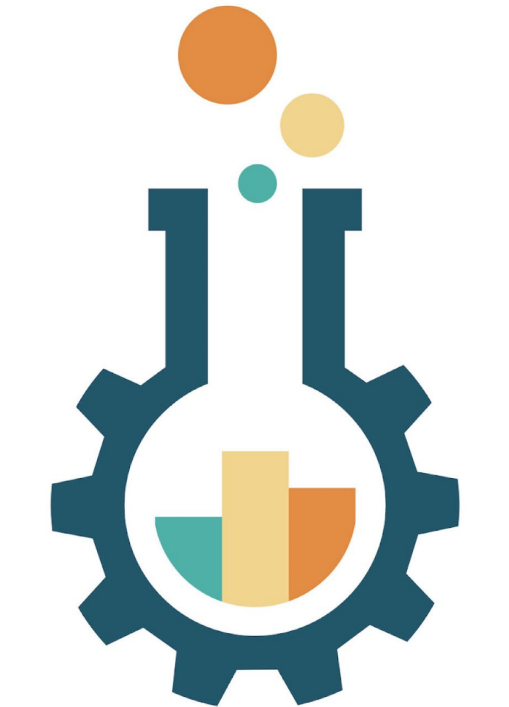
EuroHPC
Joint Undertaking

- Funded by the European Union. This work has received funding from the European High Performance Computing Joint Undertaking (JU) and countries participating in the project under grant agreement No 101093169.



- Thanks to Amazon Web Services (AWS) and Microsoft Azure for generously sponsoring the EESSI project with cloud credits, feedback, and guidance.





E E S S I

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SCIENTIFIC SOFTWARE INSTALLATIONS

Website: eessi.io

GitHub: github.com/eessi

Documentation: eessi.io/docs/

YouTube channel: youtube.com/@eessi_community

Paper (open access): doi.org/10.1002/spe.3075

EESSI support portal: gitlab.com/eessi/support

[Monthly online meetings](#) (first Thursday, 2pm CEST)

Join our mailing list & Slack channel