



EESSI meeting

2 Feb 2023

<https://github.com/EESSI/meetings/wiki>

Agenda



1. Quick introduction by new people
2. EESSI-related meetings and events in last month
3. First experiments with RISC-V
4. Progress update per EESSI layer (incl. bot for software layer)
5. EESSI pilot repository
6. AWS/Azure sponsorship update + OCRE funding opportunity
7. Update on MultiXscale EuroHPC project
8. Q&A

Quick introduction by new people



New people on the call: feel free to introduce yourself!

- Who are you, where do you work, on what?
- Why are you interested in the EESSI project?
- Are you planning to actively contribute,
and if so, to which aspect(s) of the project?

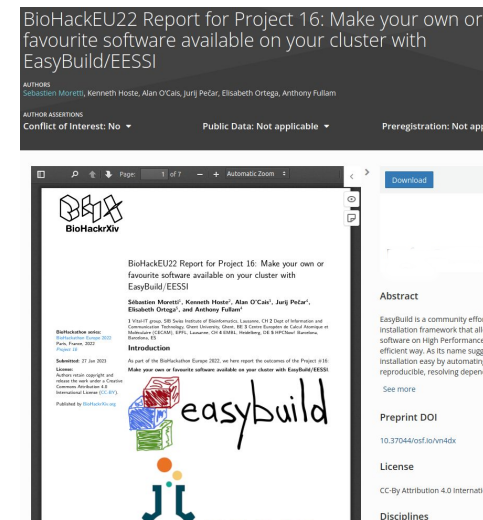
EESSI-related meetings

- There was no monthly CernVM-FS Coordination Meeting in Jan'23
 - Next: Mon 13 Feb'23 - <https://indico.cern.ch/category/5485>
- (10 Jan'23) MultiXscale sync meeting (monthly - all project partners)
<https://github.com/multixscale/meetings/wiki/sync-meeting-2023-01-10>
- (11 Jan'23) AWS/EESSI sync meeting (AWS + Kenneth/Alan/Henk-Jan)
<https://github.com/EESSI/meetings/wiki/AWS-meeting-2023-01-11>
- (20 Jan'23) Azure/EESSI sync meeting (Azure + Kenneth/Martin)
<https://github.com/EESSI/meetings/wiki/Azure-meeting-2023-01-20>
- Multiple sync meetings on development of build-and-deploy bot (MultiXscale task 5.3)
 - Attended by Thomas, Kenneth, Bob
 - Notes available at <https://github.com/multixscale/meetings/wiki/sync-meetings-bot-T5.3>
 - + additional 1-on-1 sync meetings (Thomas + Kenneth) to discuss/review/merge PRs

EESSI project at BioHackathon Nov'22



- Mon 07 Nov - Fri 11 Nov 2022
- “*Make your own or favourite software available on your cluster with EasyBuild/EESSI*” with a main goal on “Integrate EESSI in a Nextflow pipeline”
- Progress on:
 - Adding software to EESSI pilot repository (see [PR #202](#))
 - Fixes for software on some arch
 - Better deployment of large dependency base (e.g. R)
- Pending:
 - The full deployment of the pipeline tools to finalize
- Links at https://easybuild.io/biohackathon_eu_2022.html
- BioHackathon report at <https://doi.org/10.37044/osf.io/vn4dx>



[Sébastien, Kenneth]

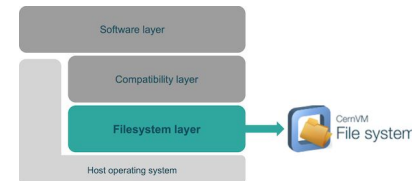
EESSI on a StarFive VisionFive 2 RISC-V SBC?



- [Kickstarter project](#) for a development board with a quad-core RISC-V CPU
- Firmware/OS/hardware support still very much in development
- Debian image available (and some custom ones based on other distros)
- Gentoo Prefix bootstrap fails
 - Stage 1: <https://bugs.gentoo.org/890363>
 - Easy workaround by installing some tools on the host
 - Stage 2: <https://bugs.gentoo.org/890636>
 - Still unclear how to solve this
- Bootstrapping in a Singularity container as we do for EESSI
 - Singularity package is available for RISC-V
 - Fails to run because of lacking kernel support for certain features



Progress update: filesystem layer



- **Planning to remove 2021.06 pilot version in EESSI repository**

- 2021.12 pilot version provides everything in 2021.06, and more (+ has updated compat layer)
- Hugo raised some concern about this via the EESSI mailing list (on 9 Jan '23)
- Current proposal:
 - Remove `/cvmfs/pilot.eessi-hpc.org(/versions)/2021.06`
 - Make `2021.06/init/bash` print a warning + source `2021.12/init/bash`
 - => People who are still using 2021.06 should not see any breakage, only a warning

- Hit a weird issue with the ingestion of updates compat layers ([issue #143](#) + [PR #144](#))

- Somehow the permissions on many directories were changed, making them inaccessible

```
$ ls -l /cvmfs/pilot.eessi-hpc.org/versions/2021.12/compat/linux/x86_64/usr
...
```

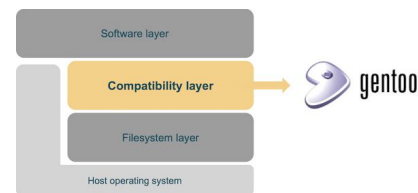
```
drwx----- 87 cvmfs cvmfs 12288 Feb  1 08:17 include
```

- Possibly related to the user IDs used on the build hosts

- Quotes for a new (physical) Stratum 0 server have been requested by RUG

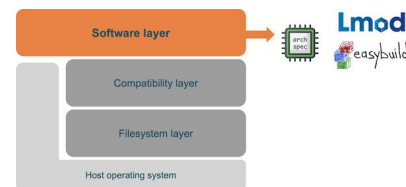
[Bob, Kenneth]

Progress update: compatibility layer



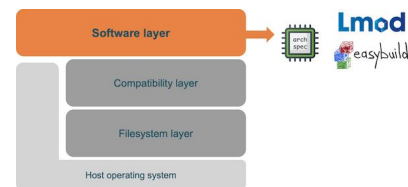
- Compat layer can now be installed with a container (i.e. without root privileges)
 - Container itself now contains Ansible and runs it in a local mode
 - Only requires Singularity/Apptainer and enough disk space
 - Also makes it possible to use the software build bot to start building compat layers
 - See [PR #163](#)
- Package updates have been performed in 2021.12 compat layer for `aarch64/ppc64le/x86_64`
 - See <https://github.com/EESSI/compatibility-layer/pull/164>
 - No known security problems reported now by Gentoo's `glsa-check` tool
 - Includes update of glibc (from 2.33-r7 to 2.34-r14) to mitigate [GLSA 202208-24](#)
 - No known impact from package updates in software layer (but testing is limited currently)
- **Known problem with permissions of some directories in 2021.12 compat layer, see [filesystem-layer issue #143](#)**

Progress update: software layer (1/3)



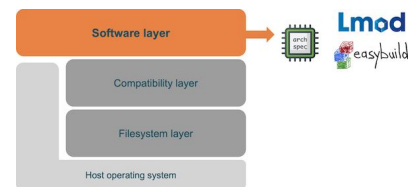
- Added to EESSI pilot 2021.12:
 - OSU-Micro-Benchmarks/5.7.1-gompi-2021a([PR #201](#))
 - R/4.1.0-foss/2021a([PR #210](#)) - **built and deployed with the bot!** (except for ppc64le/*)
- Other merged PRs:
 - Tweak scripts so they can be leveraged by software-layer bot ([PR #175](#))
 - Adjustments to scripts necessary for bot ([PR #184](#))
 - Use separate script to determine EESSI pilot version and CVMFS repo ([PR #215](#))
 - Flesh out script for checking on missing installations + fix it + test it in CI ([PR #218](#))
 - Use newer build container (Debian 11 w/ fuse-overlayfs 1.9) ([PR #219](#))
 - Update script to take into account \$EESSI_SOFTWARE_SUBDIR_OVERRIDE([PR #220](#))
 - Always exclude '.wh.*' files when creating tarball in overlay ([PR #221](#))
 - Restore original \$PATH and \$PYTHONPATH values after installing first EasyBuild module ([PR #224](#))

Progress update: software layer (2/3)



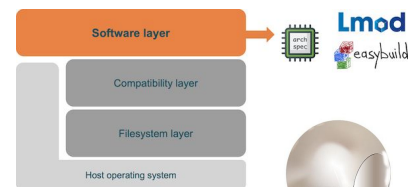
- EasyBuild v4.7.0 released (9 Jan 2023) - executive summary (see also [release notes](#))
 - Includes `foss/2022b + intel/2022b` common toolchains
 - Support for running on top of Python 2 is deprecated (prints a big fat warning)
 - `distutils.version.LooseVersion` is vendored in `easybuild.tools.LooseVersion`
 - Enhancements/changes in experimental support for easystack files
 - `gfbf` as subtoolchain of `foss + nvofbf` toolchain
 - Auto-enable use of oneAPI C/C++ compilers for intel-compilers $\geq 2022.2.0$
 - `JuliaPackage + JuliaBundle` generic easyblocks
 - `PythonPackage` easyblock is now compatible with `--sanity-check-only`
 - `framework/easyblocks` unit tests are run with Python 3.11
 - Support for 107 new software + tons of updated software versions

Progress update: software layer (3/3)



- Known issues in EasyBuild
 - Incorrect build environment when using easystack file (see [easybuild-framework issue #4194](#))
- Building of 2021.12 software layer on Ampere Altra (Arm instances in Azure)
 - Not going as smooth as hoped...
 - Problems pop up with a couple of (dependency) installations
 - Sometimes due to broken download of sources (easy to work around via `sources.easybuild.io`)
 - Some due to install script not running installations in correct order
 - Some due to updated glibc in 2021.12 compat layer (now glibc 2.34, since 1 Feb'23)
 - => We need a better way of controlling how software layer is built from scratch!

Bot for building + deploying software layer



Progress on implementation of build-and-deploy bot

<https://github.com/EESSI/eessi-bot-software-layer>

- Jan'23 => [PRs](#): 7 merged - 3 open (draft) PRs, [issues](#): 4 closed - 54 still open (+3 vs Dec'22)
 - [PR #131](#) dedicated log function
 - [PR #132](#) retry GitHub token
 - [PR #136](#) retry for PR comments (incl ~20 unit tests)
 - [PR #137](#) expose error when read_config fails
 - [PR #138](#) use `.diff` instead of `.patch` for PRs
 - [PR #141](#) pass `CPU_TARGET` to build script
 - [PR #144](#) run `bot/build.sh` if available
 - [WIP PR #85](#) tool to resubmit a build job locally
 - [WIP PR #127](#) status overview in PR description
 - [WIP PR #148](#) enhancements w.r.t. `bot/build.sh`
- Major rewrite of interface between bot and software-layer
 - Should enable the bot to build for any repository that provides a `bot/build.sh` script
 - Also making use of [software-layer PR #216](#) (`eessi_container.sh`)

EESSI pilot repository

<https://eessi.github.io/docs/pilot>

**NOT FOR
PRODUCTION USE!**



- 2021.06: considered “end of life”: **will soon be removed**
- Current status for 2021.12 (default version)
 - Compatibility layer: in place for `aarch64` / `ppc64le` / `x86_64` (security updates are in place!)
 - Software layer:
 - Software installations included in 2021.06 also in place for 2021.12, incl. GROMACS, OpenFOAM, TensorFlow + Horovod, R + Bioconductor, QuantumESPRESSO
 - Additional software (vs 2021.06): SciPy-bundle with foss/2021a, WRF, Nextflow, OSU Micro-Benchmarks, R 4.1.0, OpenFOAM v9 (partial!)
 - Targets: `aarch64/generic`, `aarch64/graviton2`, `aarch64/graviton3`, `ppc64le/generic` (partial), `ppc64le/power9le` (partial), `x86_64/generic`, `x86_64/amd/zen2`, `x86_64/amd/zen3`, `x86_64/intel/haswell`, `x86_64/intel/skylake_avx512`
 - TODO / work-in-progress:
 - Bot to automate workflow of adding software to EESSI (to avoid losing time doing it manually)
 - Ensure that Lmod cache update is done correctly, includes **all** available modules
 - Testing installing software-layer optimized for Azure's Ampere Altra (Arm) CPUs

Outlook to next pilot version (2023.x)

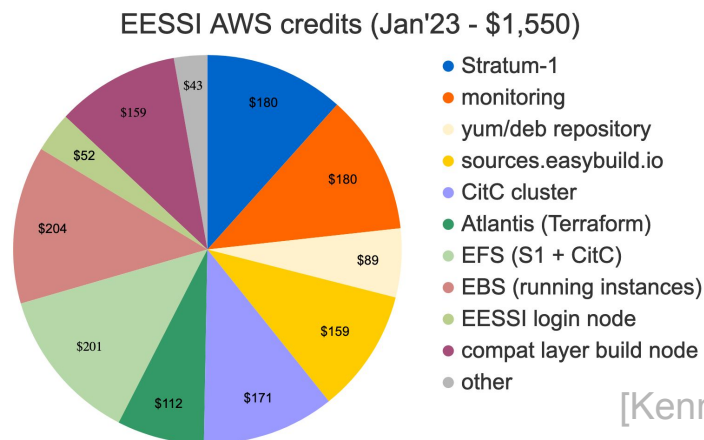
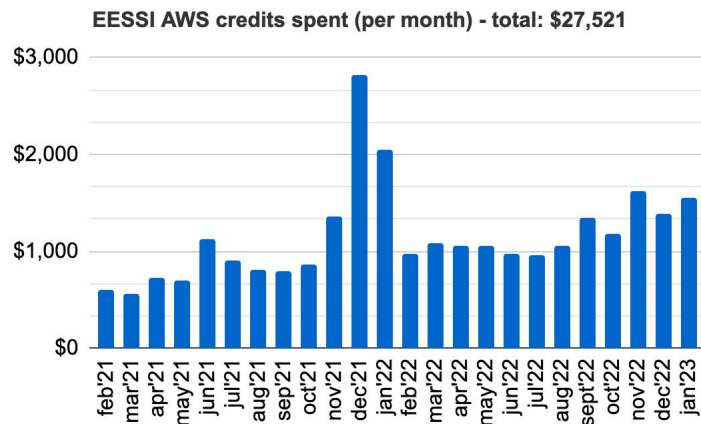


- Small changes to compatibility layer: updated Lmod, more tools, ...
- Include enhancements/changes that are necessary for CUDA GPU support
- Work towards getting rid of ugly install script, aim for easystack-only (if possible)
- **Ideally build/deploy compat + software layer via bot, no more manual deployments!**
- Initially include same software installations as in 2021.12, then **gradually expand**
- Also install software with more recent toolchains + more applications
- Stop wasting time with supporting POWER (ppc64le) - start considering RISC-V
- Alpha/beta for production EESSI repository
- Switch to `eessi.io` domain + new Stratum 0 (dedicated hardware, yubikey) - if available
- **Effort already started by Thomas: see [compat layer PR #160](#) + [gentoo-overlay PR #84](#)**
(more work needed to get a new working pilot version - 2023.x)

Sponsored AWS credits



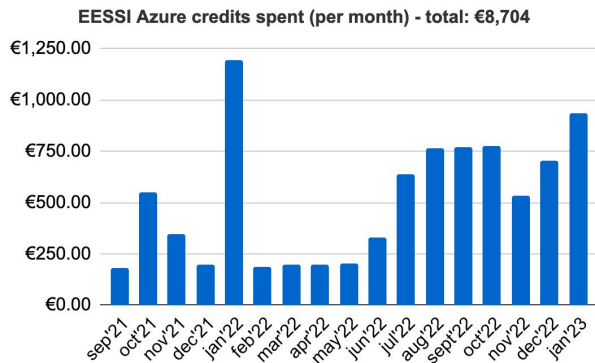
- Ask in #aws-resources Slack channel to get access!
- Monthly sync meetings with Brendan/Angel/Matt (AWS) every 2nd Thursday of the month
- **Extra batch of \$10,000 worth of credits provided for 2023Q1 (valid until end of March'23)**
- Currently still ~\$11,250 worth of sponsored credits left
- ~\$1,550 “spent” in Jan'23 on Stratum-1, monitoring, sources.easybuild.io, Slurm cluster (incl. build bot)
- ~\$27,520 worth of credits spent in total so far (since Feb'21), all covered by sponsored credits



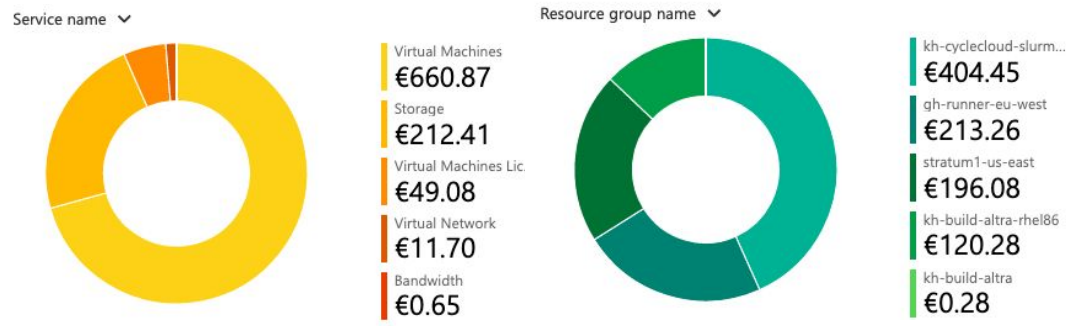
Sponsored Azure credits



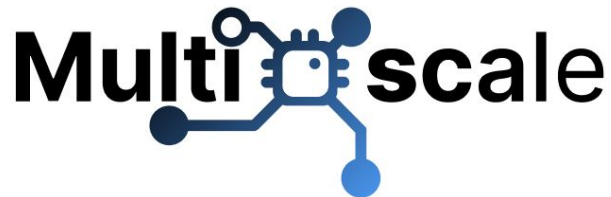
- Sponsored credits (€40,000) are being put to good use!
- **Ask in #azure-resources Slack channel to get access!**
- In Dec: ~€934 worth of credits spent
- ~€8,700 worth of (sponsored) credits spent in total (since Sept'21)
- Used for: Stratum-1, GitHub Runners, heterogeneous Slurm cluster, Ampere Altra build node
- **New: virtual Slurm cluster in Azure (set up using [Azure Cyclecloud](#)) - more info [here](#)**
 - work-in-progress: properly set up partitions for different CPU types (to the extent that's possible...)



Overview of spent credits per month



Jan'23



EuroHPC
Joint Undertaking



- **MultiXscale** is a EuroHPC project: *Centre of Excellence in Exascale-Oriented Application Co-Design and Delivery for Multiscale Simulations*
- 16 partners in 8 countries (incl. UGent, RUG, UBergen, UBarcelona, ...)
- 8 work packages (WPs) - 2 directly related to EESSI (+ training, dissemination, ...)
- Total budget: ~6M EUR (of which ~50% for WPs related to EESSI)
- 4 year project (~2023-2027), ~5 FTE for WPs related to EESSI
- **Project started on 1 Jan 2023 - official kickoff meeting 23-24 March 2023**
- **Effort is ongoing, cfr. progress on build-and-deploy bot**
- Presentation on MultiXscale project & relation to EESSI at EESSI Community Meeting see <https://eessi.github.io/docs/meetings/2022-09-amsterdam/#fri-16-sept-2022>
- Project logo available, website coming soon...

[Kenneth, Bob, Thomas, Alan, ...]

Upcoming events

- FOSDEM'23 @ Brussels (Sat-Sun 4-5 Feb 2023)
 - <https://fosdem.org/2023> - [check out the HPC devroom!](#)
- EuroHPC Summit, @ Gothenburg (Mon-Thu 20-23 March 2023)
 - <https://www.eurohpcsummit.eu>
- EuroHPC MultiXscale CoE kickoff meeting @ Ljubljana (Thu-Fri 23-24 March 2023)
- EasyBuild User Meeting (being planned - London end of April 2023)