EESSI

EUROPEAN ENVIRONMENT FOR
SCIENTIFIC SOFTWARE INSTALLATIONS

7 Mar 2024

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

Agenda

1. Quick introduction by new people

2. EESSI-related meetings and events in last month

3. Progress update per EESSI layer

4. Update on EESSI production repository `software.eessi.io`

5. Update on EESSI test suite + build-and-deploy bot

6. EESSI support portal

7. AWS/Azure sponsorship update

8. Update on MultiXscale EuroHPC project

9. Upcoming/recent events: EuroHPC Summit + EasyBuild User Meeting 2024 + ISC'24

10. 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 & events (1/2)

- *(9 Feb'24)* Meeting with CASTIEL2 and EuroHPC Hosting Entities on CernVM-FS + EESSI

- *(9+16 Feb'24)* Meetings to prepare MultiXscale project review

- *(13 Feb'24)* MultiXscale WP1+WP5 sync meeting

- *(19 Feb'24)* **MultiXscale project review meeting** @ EuroHPC headquarters in Luxembourg

- *(20 Feb'24)* presentation for + discussion with team managing EuroHPC JU system MeluXina

- *(23 Feb'24)* MultiXscale project review post-mortem Luxembourg

[Bob, Kenneth]

EESSI-related meetings & events (2/2)

- *(12 Feb'24)* CernVM-FS Coordination Meeting ([notes](#))

- *(15 + 29 Feb'24)* Sync meeting on EESSI test suite ([notes](#), [notes](#))

- *(23 Feb'24)* Sync with Vega support team on use of EESSI during Demo Lab at EuroHPC Summit

- *(26 Feb'24)* Talk at Flemish AI Academy course by Lara & Kenneth, mentioning EESSI

- *(Feb'24)* Weekly support team sync meetings *(notes are in private wiki on EESSI support portal)*

- *(5 Mar'24)* Meeting with S. Bollman (Univ. of Queensland) - interest in making EESSI available

[Bob, Kenneth]

Progress update: filesystem layer
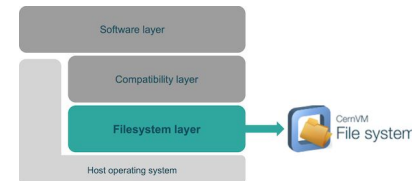
- Get the CernVM-FS sync server configured and documented properly
  - Use EESSI sync server as Stratum 0 (merged PR #177) + docs PR #157 (still open)
  - Required some changes in the ansible-cvmfs role from the Galaxy project
    - Forked the role: https://github.com/EESSI/ansible-cvmfs
    - Use our fork of the ansible-cvmfs role (open PR #179)

- Bump FPM action to latest commit (merged PR #178)

- Add build container based on Debian 12 (open PR #180)

- Script for updating the Lmod caches of all supported CPU targets (PR #175)
  - Can be run on the Stratum 0
  - Prevents that Lmod cache is overwritten with outdated copy when tarball is ingested

- Planning to create additional repos: `dev.eessi.io`, `multixscale.eessi.io`, `riscv.eessi.io`

[Bob, Kenneth]

Progress update: compatibility layer
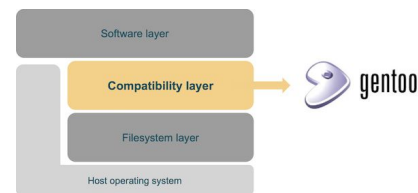
- Run ReFrame tests on `software.eessi.io` instead of `pilot.eessi-hpc.org` (merged [PR #196](#))

- Add Debian Sid build container with support for `riscv64`, drop support for `ppc64le` (merged [PR #200](#))

- 2023.06 version for `software.eessi.io` (see [PR#191](#))
  - Security updates for openssl, zlib, glibc packages installed (cfr. [PR #197](#))
  - Recent [Gentoo Linux Security Advisories](#) do not apply to compat layer, except the one for `libxml2`

- Install `nss-pam-ldapd` and `sssd` in compat layer with custom USE flags (open [PR #199](#) and gentoo-overlay [PR #99](#))
  - Only installs the clients, and communicates with the host daemons; no need for host symlinks anymore
  - Should solve LDAP / user ID resolving issues, see https://gitlab.com/eessi/support/-/issues/32

- 2023.06 version in EESSI pilot repository (`pilot.eessi-hpc.org`)
  - No recent changes here, **EESSI pilot repository is no longer actively maintained!**
  - Initialization script should make this (very) clear
    - Should suggest to use `software.eessi.io` instead
    - Or even automatically (try to) use init script in `software.eessi.io` instead?

[Thomas, Bob, Kenneth]

Progress update: software layer
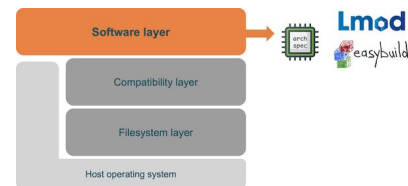
- Recently merged PRs:

  - More software: BWA ([PR #468](#)), dask ([PR #481](#)), GDAL ([PR #419](#)), LAMMPS (PRs [#472](#) + [#477](#)), matplotlib + PyQt5 ([PR #476](#)), OSU Microbenchmarks w/ CUDA ([PR #487](#)), snakemake ([PR #474](#)), waLBerla ([PR #478](#)), WRF ([PR #480](#))

  - Add Lmod hook to set `$OMPI_MCA_btl` to `^smcuda` when loading OpenMPI module to work around bug ([PR #473](#))

  - Temporary fix for CI by pinning archspec version ([PR #482](#))

  - Make `check_missing_installations.sh` check against develop branch of EasyBuild ([PR #486](#))

[Kenneth, Thomas, Richard, Pedro, Bob, Lara, Caspar, Satish, Xin, Alan, …]

Progress update: software layer
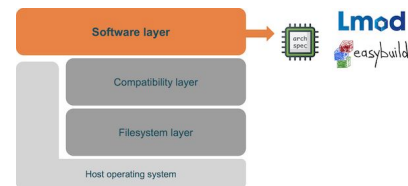
- Recent active open PRs:

  - More software: CDO v2.2.2 ([PR #492](#)),GROMACS ([PR #401](#) + [PR #463](#)),
    OpenFOAM v10 ([PR #404](#)), R-bundle-CRAN ([PR #428](#)), ImageMagick ([PR #445](#)),
    R v4.2.2 ([PR #452](#)), Qt5 ([PR #462](#)), WSClean 3.4 + DP3 6.0 ([PR #479](#))

  - Script to determine license for software being included in EESSI ([PR #457](#))

  - Run EESSI test suite after building software with bot ([PR #467](#))

  - Make EESSI compatible with archspec 0.2.3+ ([PR #485](#))

  - Add functionality for rebuilding software + try it on OpenMPI 4.1.x (WIP [PR #488](#))

  - Change LMOD RC file setup: use `$LMOD_CONFIG_DIR` instead of `$LMOD_RC` and
    add namespace prefix to hooks ([PR #490](#))

[Kenneth, Thomas, Richard, Pedro, Bob, Lara, Caspar, Satish, Xin, Alan, …]

Progress update: software layer
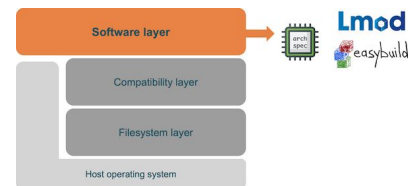
- Relevant EasyBuild PRs:

    - Add multiarch support for RISC-V to GCCcore 12.x and 13.x ([easyconfigs PR #20035](#))

    - Enable RPATH linking by default ([framework PR #4448](#), for upcoming EasyBuild 5.0)

    - Add support for `--from-commit` ([framework WIP PR #4468](#))

[Kenneth, Bob, Alan, …]
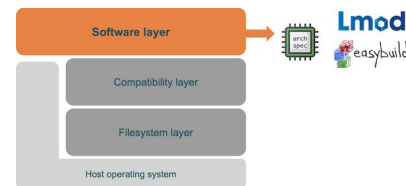
Progress update: software layer

Supporting RISC-V as CPU target for EESSI
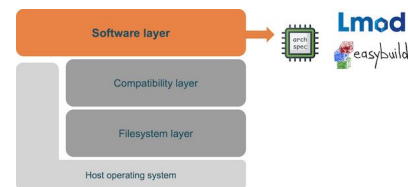
1) CernVM-FS client for RISC-V built from source

  - Fixed problem with old `config.guess` files when building dependencies:
    - libresssl-3.5.3
    - Protobuf-2.6.1
  - Reported in CVMFS issue#3441
  - Solved through CVMFS PR#3446

[Julian, Bob]

Progress update: software layer

Supporting RISC-V as CPU target for EESSI

2) Gentoo Prefix bootstrap in RISC-V machine

- ○ Fixed problem in `bootstrap-prefix.sh` when detecting architecture tuple (*Stage 1*)
  - ■ Solved with Gentoo Prefix commit#923410

- ○ Fixed `bits/libc-header-start.h: No such file or directory` (*Stage 2*)
  - ■ Previously reported in GCC bug#106271 so applying same patch solved the issue
  - ■ Error and solution reported in Gentoo bug#890636
  - ■ Solved through commits:
    - ● 13.2.0: add 91_all_riscv_pr106271-multilib-bootstrap.patch
    - ● 12.3.0: add 77_all_riscv_PR106271-multilib-bootstrap.patch
    - ● sys-devel/gcc: fix prefix riscv bootstrap for 12
    - ● sys-devel/gcc: fix prefix riscv bootstrap for 13
  - ■ See also easyconfigs PR #20035 to add patch for GCC in EasyBuild

[Julian, Bob]

Bot for building + deploying software layer

https://github.com/EESSI/eessi-bot-software-layer
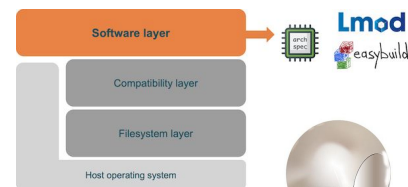
- Release v0.4.0 (28 Feb'24)

  - PR#248 Make bot report problems when downloading PR

  - PR#251 Fix for `bot: status` command

  - PRs #247, #249, #250, #254: sync NESSI and EESSI bot code bases (mostly adding PR comment id to uploaded metadata)

  - PR#254 Make location for uploads configurable (part of the sync, but also first step towards improving deployment)

  - PR#255 Fix for job manager crash when contacting Slurm controller fails

  - PR#257 Let bot only respond to comments that contain a bot command

- Next: improve deployment

[Bob, Kenneth, Lara, Pedro, Thomas]

EESSI production repository

eessi.io/docs

`software.eessi.io` is the **production-ready EESSI repository**

- Version 2023.06 is now being populated with software via PRs to software-layer repo + build-and-deploy bot

  - Supported CPU targets: see eessi.io/docs/software_layer/cpu_targets

  - Initial support for NVIDIA GPUs is in place, see eessi.io/docs/gpu

  - **We currently have 438 software installations per CPU target** (+78 compared to last month)
    - 251 different software projects (+51), ~3,520 software installations (across 8 CPU targets, +650)

  - Current focus:
    - Adding software relevant for MultiXscale project + EESSI demos
    - Processing incoming contributions to add more software
    - Fix failing installations in EESSI build environment, failing tests on `aarch64/neoverse_v1`, etc.

  - Actively preparing to also providing optimized software installations for AMD Genoa systems (Zen4)

[Kenneth, Bob, Alan, Caspar, Lara, Thomas, Richard, Pedro, Xin, …]

EESSI documentation

eessi.io/docs - GitHub repo github.com/EESSI/docs

Improvements to the EESSI documentation

- Update to EESSI demo documentation: TensorFlow (PR #152)

- Added references to https://status.eessi.io and http://status.eessi-infra.org (PR #153)

- Replace reference to pilot repository (PR #154)

- Document new partition features for the EESSI test suite (PR #156)

- Formatting fixes (PR #155)

WIP: auto-updated overview of available software in EESSI

[Kenneth, Thomas, Xin, Caspar, Lara, Pedro]
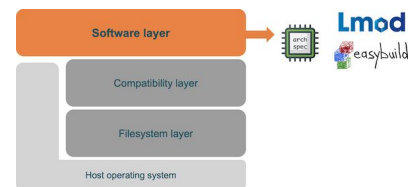
EESSI test suite

New release *today (Thu 7 Mar'24)*: **v0.2.0**

Merged pull requests:

- Updated `common_config.py` to support `software.eessi.io`: ensure the same EESSI environment is used in test jobs as was used on the submit host (where `reframe` was run) ([PR #114](#))
- Adding `ALWAYS_REQUEST_GPUS` as system feature now makes sure at least one GPU is requested from the batch scheduler (for systems where submitting to GPU partition without requesting GPUs is blocked) ([PR #116](#), [PR #121](#))
- OSU-MicroBenchmark: bug fixes ([PR #117](#), [PR #118](#))
- Code cleanup + formatting check in CI ([PR #120](#))
- Adapt common_config.py to redirect ReFrame report file to same prefix as other log files ([PR #122](#))

Open pull requests: None

[Caspar, Sam, Satish, Kenneth, Lara]

Support for EESSI (MultiXscale task 5.4)

- EESSI support portal**:** gitlab.com/eessi/support
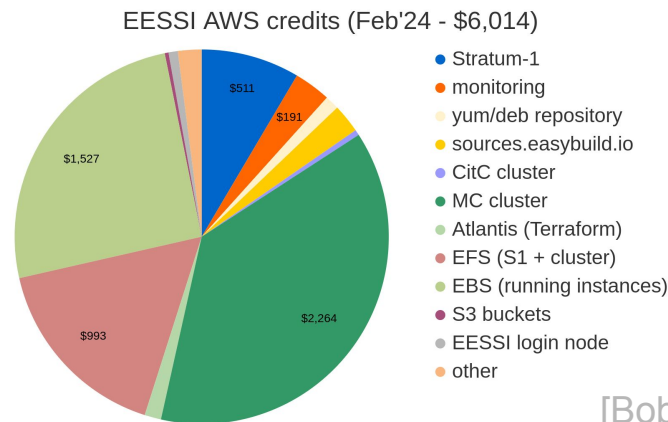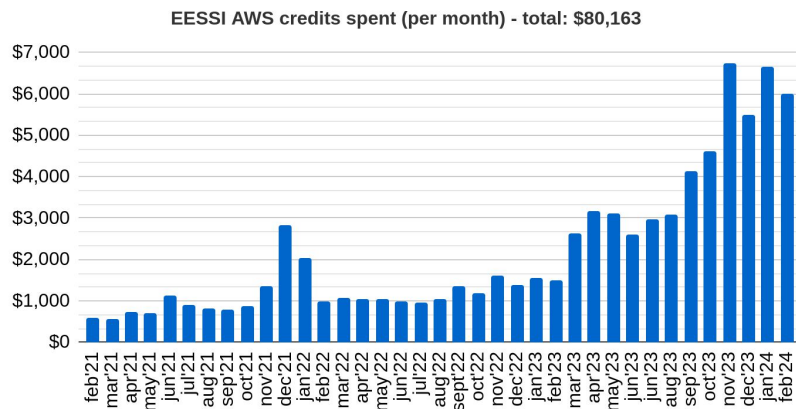
  - Support requests can be created by:

    - Opening an **issue in GitLab**

    - Sending an **email** to `support@eessi.io`

  - Issues in support portal can be public or private (only visible to reporter + support team)

  - **Information on support portal and support policy => https://eessi.io/docs/support**

  - Support is "reasonable effort" + only for problems with how software was installed in EESSI

  - 7 support issues opened in last month (some of which are by support team to track ongoing tasks)

- Support rotation (in scope of MultiXscale Task 5.4)

  - A MultiXscale project partner is primarily responsible for support for 2 consecutive weeks

  - Weekly regular support sync meetings between MultiXscale project partners

  - Since Jan'24: ~1 FTE dedicated for support effort (across all project partners)

  - Project partners involved in Task 5.4: UGent (lead), SURF, UGroningen, UBarcelona, UBergen, HPCNow!

[Lara, Kenneth, Caspar, Bob, Danillo, Alan, Thomas, …]

Sponsored AWS credits

- Ask in #aws-resources Slack channel to get access!

- ~$6,014 "spent" in Feb'24 on Stratum-1 servers, monitoring, sources.easybuild.io, debugging (build) issues, **Slurm clusters (build bot)**

- **Increase in consumed credits due to extensive activity with build-and-deploy bot**

- Frequent sync meetings with Brendan/Angel/Matt/Francesco (AWS)

EESSI AWS credits spent (per month) - total: $80,163

EESSI AWS credits (Feb'24 - $6,014)

Legend: Stratum-1, monitoring, yum/deb repository, sources.easybuild.io, CitC cluster, MC cluster, Atlantis (Terraform), EFS (S1 + cluster), EBS (running instances), S3 buckets, EESSI login node, other

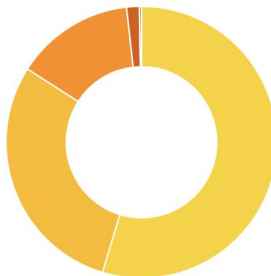$511, $191, $1,527, $993, $2,264

[Bob, Kenneth]

Sponsored Azure credits

- Ask in #azure-resources Slack channel to get access!

- In Feb'24: ~€468 worth of credits spent

- Used for: Stratum-1 mirror servers, GitHub Runners, Slurm cluster for bot

- **Slurm cluster with Magic Castle currently being configured, will be operational ASAP**

EESSI Azure credits spent (per month)
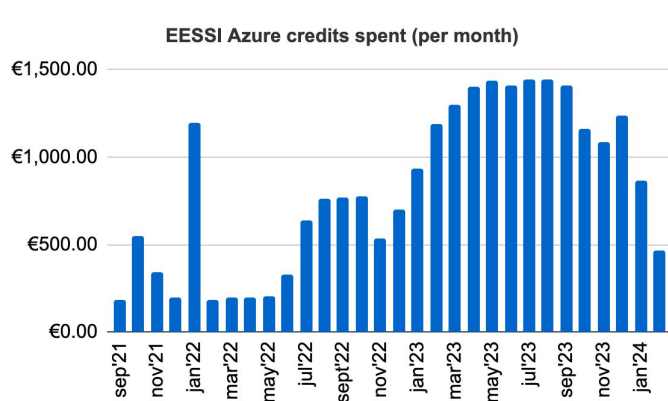
Service name ⌄

Virtual Machines	€256.24
Storage	€137.89
Virtual Machines Lic…	€66.39
Virtual Network	€7.09
Bandwidth	€1.19

Resource group name ⌄

stratum1-us-east	€207.03
eessi.io-stratum1-us…	€197.53
test_group	€42.43
gh-runner-eu-west	€21.31
eessi	€0.25

Feb'24

[Bob, Kenneth]

Multi scale

www.multixscale.eu   github.com/multixscale

- MultiXscale deliverables (2023): multixscale.eu/deliverables

- **Project review meeting (19 Feb'24)**

    ○ Very positive feedback on EESSI aspects of the project

- Via CASTIEL2 CoE, we are in touch with EuroHPC Hosting Entities to make EESSI available

    ○ EESSI is already available on Vega (Slovenia) and Karolina (Czech Republic)

    ○ Kenneth met with MeluXina team in Luxembourg on Tue 20 Feb

    ○ **Some pressure from EuroHPC JU to have a common software stack adopted everywhere (and EESSI is gaining momentum as the viable option)**

    ○ CernVM-FS tutorial and best practices sessions (incl. our Canadian colleagues) are being arranged

[Alan, Kenneth, Lara, Bob, Pedro, Thomas, Richard, Caspar, Satish, Xin, Elisabeth, …]

EuroHPC Summit 2024
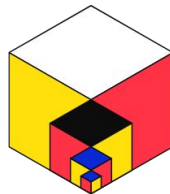
- 18-21 March 2024 in Antwerp (Belgium) - https://www.eurohpcsummit.eu

- **Great event to promote EESSI!**

- Busy week for MultiXscale project partners…

    - Multiple speaking slots:

        - "**Centres of Excellence: Deploying Flagship Codes on EuroHPC Supercomputers**"

        - "Elevate and Collaborate: European HPC NCCs and CoEs Workshop"

    - MultiXscale poster (incl. EESSI), hopefully also live demos with EESSI

    - EESSI part of "EuroHPC Demo Lab", https://www.eurohpcsummit.eu/demo-lab

[Kenneth, Lara, Alan, Thomas, Elisabeth, …]

EasyBuild User Meeting 2024
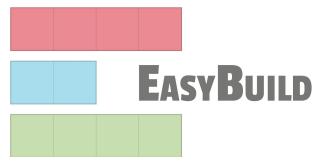
- Tue-Thu 23-25 April 2024 @ Umeå University (Sweden) - https://easybuild.io/eum24

- Yearly meeting, focus on EasyBuild & related projects

- **Registration for on-site attendance + virtual attendance is open!**

- Partial program now available: https://easybuild.io/eum24/#program (more info soon)

- Thursday 25 April will be focused on EESSI, **speakers to be confirmed**:

  - Intro to EESSI + overview of current status

  - Contributing to EESSI

  - Hands-on sessions (user experience as sysadmin, user, contributor)

  - EESSI test suite, GPU support in EESSI, …

[Kenneth, Lara, …]

EESSI @ ISC'24

- 12-16 May 2024 in Hamburg (Germany) - isc-hpc.com

- 3 tutorial proposals submitted - **Good reviews but all rejected** :(

  - *Magic Castle: Terraforming the Cloud to Teach HPC* (EESSI as software stack)
    by Félix-Antoine Fortin (Magic Castle lead developer) + Alan & Kenneth

  - *Efficient Software Distribution for HPC: an Introduction to CernVM-FS* (EESSI as example repo)
    by Kenneth, Lara, Alan, Bob (EESSI) + Laura, Valentin, Jakob (CernVM-FS development team)

  - *Streaming Optimised Scientific Software: an Introduction to EESSI* (user-facing tutorial)
    by Sebastian Achilles (JSC) + Kenneth & Alan

- **Proposal for Birds-of-a-Feather session "EESSI Community BoF" accepted**

- Working on submission for RISC-V workshop

- We may/should also organise some kind of social event…

[Kenneth, Alan, Lara, Elisabeth, …]