



EESSI meeting

5 May 2022

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

Agenda



1. Quick introduction by new people
2. EESSI-related meetings in last month
3. Progress update per EESSI layer
4. 2021.12 version of pilot repository
5. AWS/Azure sponsorship update
6. Upcoming events
7. Q&A

Quick introduction by new people



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

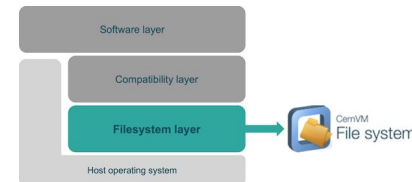
- Who are you, where do you work, on what?
- Why are you interested in the EESSI project?
- Are you planning to actively contribute,
and if so, to which aspect(s) of the project?

EESSI-related meetings



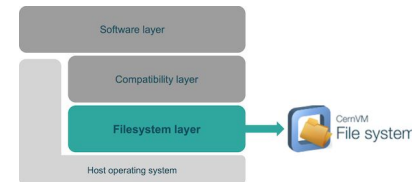
- April 5th: EESSI/Azure sync: got cancelled (bad timing w.r.t. vacation)
- April 11th: CernVM-FS coordination meeting
 - Not attended by anyone from EESSI?
 - Only agenda point was CernVM-FS v2.9.2 release (already running on our Stratum-1's)
- April 25th: AWS/EESSI sync
 -

Progress update: filesystem layer (1/2)



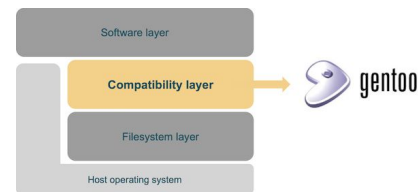
- Data repository (`data.eessi-hpc.org`) ([PR #119](#))
 - Still needs to be deployed on Stratum-1's?
- “latest” symlink was updated, now points to 2021.12 version of EESSI pilot repository
 - See [PR #115](#)
 - Small bug fix(es) for Ansible playbook were required (PRs [#118](#) + [#124](#))
- CI tests for macOS have been disabled for now ([PR #121](#))
 - Due to bug in CernVM-FS (segfault on macOS) - follow-up via [issue #122](#)
- Trivial fix for Ansible linter check in CI ([PR #120](#))

Progress update: filesystem layer (2/2)



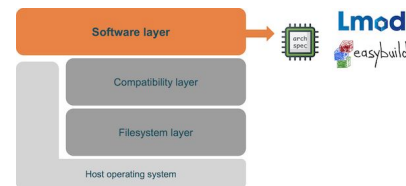
- Update on CernVM-FS bug causing corruption if files are being updated in place
 - Cfr. <https://sft.its.cern.ch/jira/browse/CVM-2001>
 - “Even with direct I/O and certain combination of mmap operations, cache poisoning can happen”
 - Related issue ([see GitHub](#)) seems to have triggered taking action to fix this bug
- Report in Slack by Compute Canada about fallout when updating to CernVM-FS 2.9.0
 - Turns out problems were caused by security-related services
 - IPS (Intrusion Prevention System) was interfering with CernVM-FS alien cache preloading
 - Sites using IPS need exclusions for CernVM-FS traffic to avoid risk of self-inflicted outages...

Progress update: compatibility layer



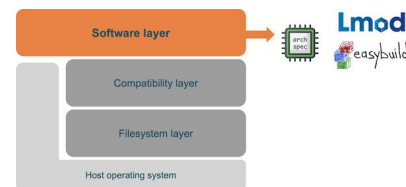
- No security updates required for 2021.06 and 2021.12 compat layers (as reported by Gentoo's `glsa-check` tool)
 - There were some new GLSA's, but only for web browsers
- Google Summer-of-Code (GSoC) project “*RISC-V support for Gentoo Prefix*”
 - https://wiki.gentoo.org/wiki/Google_Summer_of_Code/2022/Ideas/RISC-V_support_for_Gentoo_Prefix
 - Project mentors: Kenneth Hoste + Guilherme Amadio (CERN, Gentoo)
 - Motivated student has put together a high quality project proposal
 - It's now up to the Gentoo admins to rank project proposals, and then make final selection

Progress update: software layer (1/3)



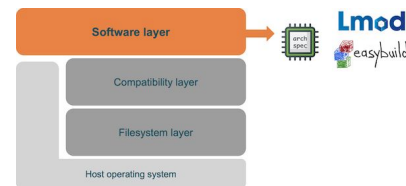
- EasyBuild v4.5.4 release (31 March 2022)
 - Basic support for toolchain that includes MPItrampoline (rather than a specific MPI library)
 - `eb --show-system-info` will now also report on AMD GPU availability
 - Enhancements to make it easier to use Intel MKL as backend for FlexiBLAS
 - Fix for log leaking problems for easyconfigs using `Bundle easyblock`
 - Fix for Ninja trying to use all visible cores when building Qt5 (even when it's not supposed to)
 - More details: https://docs.easybuild.io/en/latest/Release_notes.html

Progress update: software layer (2/3)



- [PR #4003](#) to EasyBuild to enable RPATH wrapper shipping with a compiler installation
- Easyblock (e.g. `gcc.py`) calls `create_rpath_wrappers`, new helper in `toolchain.utilities`
- It internally calls a modified `toolchain.prepare_rpath_wrappers()`
- **Problem 1:** `prepare_*` now has two purposes! Refactor into two methods?
 - Create RPATH wrappers during module build, wrappers point to `gcc/ld` in `/tmp` dirs
 - Install RPATH wrappers with new module, wrappers point to `gcc/ld` of the module
- **Problem 2:**
 - EESSI ships `ld (binutils)` with compat layer: `prepare_*` needs special case to handle EESSI situation (ignore PATHs with `/tmp` or choose `/cvmfs/...` explicitly)
 - How to approach EESSI specialities in EasyBuild?

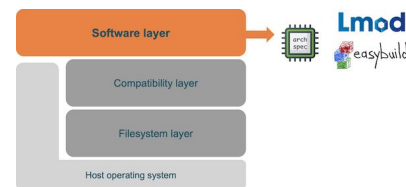
Progress update: software layer (3/3)



- Kickstart working group to resume effort of implementing a bot to automate workflow of deploying additional software to EESSI (pilot) repository
- Can be based on Kenneth's PyGHee library (<https://github.com/boegel/pyghee>)
- Should maybe developed in context of EasyBuild? (repo under github.com/easybuilders)
- A well-designed bot can also be leveraged to automate deployment of software with EasyBuild in central software stack that is local to HPC systems...
- Doodle to find 1+1 hour slot for meeting to discuss this next week:
<https://doodle.com/meeting/participate/id/egJE2DZd>

Please fill out the doodle no later than Fri 6 May 2022 13:00 CEST

Call for testing: PoC GPU support



- Proof-of-concept script for supporting GPUs developed during hackathon
- See [05_gpu branch in 2021-12 hackathon directory of EESSI/hackathons repo](#)
- **Would be great to get feedback on how well it works, what needs to change...**
- Requirement: write access to `/cvmfs/pilot.eessi-hpc.org/host_injections`
 - By default: symlink to `/opt/eessi`, but can be changed via CVMFS client configuration
- Also requires `rpm2cpio` to be available (will be installed in compat layer eventually)
- Enhanced version available in [Michael Hübner's gpu_support branch](#) (tested in Debian 10)

EESSI pilot repository

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

**NOT FOR
PRODUCTION USE!**



- 2021.06: considered “final” (no further changes, except security updates in compat layer if needed)
- Current status for 2021.12 **[default]** (mostly unchanged in recent months)
 - Compatibility layer: in place for `aarch64` / `ppc64le` / `x86_64`
 - List of installed packages is pretty much identical \o/
 - 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 (excl. `ppc64le`), WRF
 - **Docs for pilot repository were updated ([PR #86](#))**
 - TODO:
 - Ensure that Lmod cache update is done correctly, includes **all** available modules (first step: [PR #168](#))
 - Bot to automate workflow of adding software to EESSI (to avoid losing time doing it manually)

Progress update: infrastructure (1/2)



- With Azure support working well... It is time to leverage true cloud redundancy!
 - First job, host the [status page](#) in both AWS and Azure
 - This means using small boring VMs, as sharing deployment setup between Azure Automation and AWS lambda is far from copy-paste
 - Configuration deployment to VMs sets up the status page via Ansible, and
 - With the EESSI terraform modules, node deployment is easy:

```
module "testing-github-auth" {  
  source      = "../modules/aws-test-node"  
  subnet_id   = module.aws-test-vpc.public_subnet  
  hostname    = "github-auth-aws"  
  arch        = "x86_64"  
  public_ip   = true  
  instance_size = "small"  
  security_groups = [module.ssh_global_access_sgsecurity_group_id]  
}
```

AWS

```
module "testing-github-auth" {  
  source      = "../modules/azure-test-node"  
  subnet_id   = module.azure-test-vpc.public_subnet  
  hostname    = "github-auth-azure"  
  os          = "ubuntu"  
  public_ip   = true  
  instance_size = "small"  
  security_groups = [module.ssh_global_access_azure_sgsecurity_group_id]  
}
```

Azure

Progress update: infrastructure (1.5/2)



- TODOs on the Terraform modules... (Before migrating the production environment?)
 - Abstract out the network information based on provider + region
 - Abstract out the security groups to labels that do the right thing depending on provider... We want to ask for `security_groups = ["ssh", "https"]` and have the underlying module figure out what that implies for the provider in question
 - Code the rest of the Azure bits...
 - If at all possible, push to and import from <https://registry.terraform.io> ala <https://registry.terraform.io/modules/terjekv/ami-search/aws/latest>
 - Sadly, a lot of this work takes more time than effort... :(

Progress update: infrastructure (2/2)



- Migration away from fixed prebuilt images created via `packer`
 - No longer limiting EESSI node deployment to regions where images are deployed
 - Multi-distribution support through the Terraform module (RHEL, Fedora, Debian++)
 - No need to push images for every cloud provider out there
- Blank images then!
 - Problem: Authentication model... We used to prepopulate images with keys (this is bad, what if someone quits?)
 - Solution? [cloudposse/github-authorized-keys](https://github.com/cloudposse/github-authorized-keys) authenticating using Github Teams
 - Problem: Abandoned code base, and only supports one user group (admins)
 - Solution? Fork, extend, fix: [terjekv/github-authorized-keys](https://github.com/terjekv/github-authorized-keys)
 - And as a bonus, Terje had to learn Go...

Progress update: monitoring

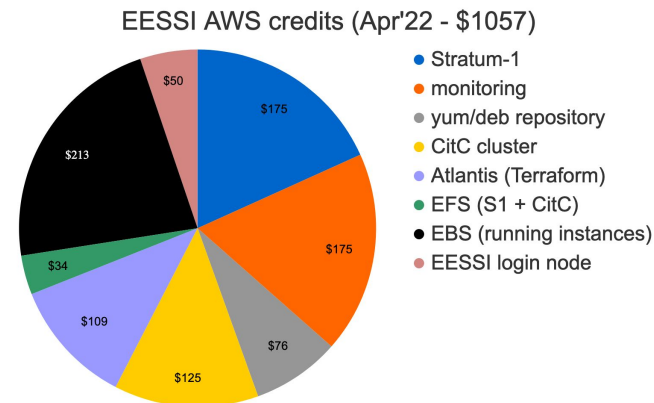
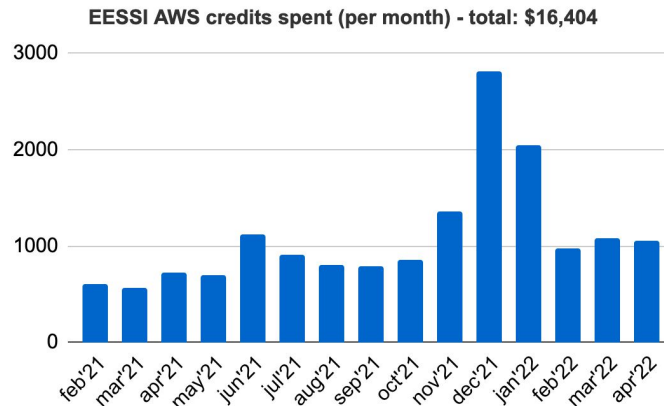


- CVMFS patch for CVMFS version and OS version in meta.json is not merged <https://github.com/cvmfs/cvmfs/pull/2863>
 - Internal testing seems to be the problem, not the patch
 - Awaiting the CVMFS patch before moving onwards with monitoring@eessi
- [CVMFS server scraper](#) pushed to [PyPI](#)
- Redeployment of monitoring node a priority, currently vastly over-allocating resources
- Made some very basic test deployments in the testing environment, but...
 - Need to copy out grafana dashboards and their sources
 - Need to verify generation of configuration for both Grafana and Prometheus

Usage of sponsored AWS credits



- **Ask in #aws-resources Slack channel to get access!**
- Original batch of \$25,000 worth of sponsored credits expired on Jan 31, 2022!
- Request for new credits is WIP, extra \$10k worth of credits already received to bridge the gap
- **~\$6,900 worth of sponsored credits left**
- In April '22: ~\$1,057 worth of credits spent on Stratum-1 server, monitoring node, ...
- ~\$16,404 worth of credits spent in total so far (since Feb'21), all covered by sponsored credits



Azure sponsorship



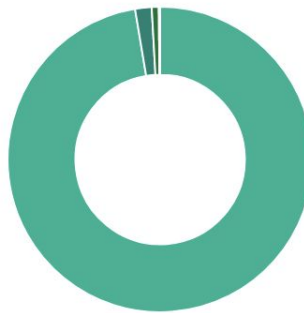
- Sponsored credits (€40,000) are being put to good use!
- **Ask in #azure-resources Slack channel to get access!**
- In April'22: ~€196 worth of credits spent, pretty much all on Stratum-1
- ~€3,051 worth of credits spent in total (since Sept'21)

Service name ▾



Virtual Machines	€100.67
Storage	€62.64
Virtual Machines Lic...	€30.95
Virtual Network	€1.95
Bandwidth	€0.07

Resource group name ▾



stratum1-us-east	€191.11
gh-runner-eu-west	€3.44
bd-demo	€1.46
cloud-shell-storage-...	€0.22
eessi	€0.06

OCRE Funding call



- <https://www.ocre-project.eu>
- European Open Science Cloud (EOSC) project (from what I can tell)
- Voucher model for cloud providers to support resources and consultancy
 - IaaS, PaaS, SaaS
 - Up to €500,000-worth of cloud infrastructure, platform and software services
 - Cloud provider submits the project
- No personnel funding, vouchers only
 - 500K not small, likely some bureaucratic overhead attached...
 - Might actually reduce time to develop EESSI!

Upcoming events



- EESSI will be briefly mentioned @ **KubeCon Europe 2022** (Valencia, 16-20 May 2022)
 - *“Unlimited Data Science Libraries, One Container Image, No Installation!”*
 - Wed 18 May 2022 at 11:55 CEST (“Machine Learning + Data” track)
 - Joint talk by Kenneth Hoste (HPC-UGent) & Guillaume Mouter (Red Hat)
 - This work was not using EESSI yet, but planned for “future work”...
 - [Link to talk abstract + slides](#)
- **ISC 2022** (Hamburg, 29 May - 2 June 2022)
 - Half-day EasyBuild tutorial on Sun 29 May ([ISC'22 link](#))
 - Talk on EESSI by Bob at pre-ISC Dell event (cfr. <https://dellhpc.org/events/23148>)