EESSI meeting

Nov 4th 2021

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

Agenda

1. Quick introduction by new people
2. EESSI-related meetings in last month [Bob]
3. 2021.06 version of pilot repository [Kenneth, Bob]
4. Testing of pilot version 2021.06 [Hugo, Thomas]
5. Progress update per EESSI layer [Kenneth, Bob]
6. Infrastructure updates [Terje]
7. AWS/Azure sponsorship update [Kenneth, Bob]
8. Update on EESSI journal paper [Thomas]
9. EESSI risk analysis [Thomas]
10. Upcoming events
11. 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 pilot repository

NOT FOR PRODUCTION USE!

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

- **2021.03 has been removed!**
- **2021.06 version of pilot software stack is in place and is now the default version**
  - Target CPUs:
    - `{aarch64,x86_64,ppc64le}/generic`
    - `intel/{haswell,skylake_avx512},amd/{zen2,zen3},aarch64/graviton2, ppc64le/power9le`
  - Software: Bioconductor, GROMACS, OpenFOAM, R, TensorFlow, Spark, IPython, Horovod, QuantumESPRESSO, ReFrame, … (some stuff excluded for `ppc64le`…)
- We should start making plans for the next pilot soon!
  - Find a way to support Nvidia GPUs without shipping CUDA in our repository
  - Provide linker wrappers for user-compiled software: see slide about testing
  - Add more software, and use a newer toolchain?
  - Support AMD GPUs?
  - TODO: set up a meeting to discuss this

[Kenneth, Alan, Bob]

Testing of pilot version 2021.06

- Just some initial hands-on experience on Azure
- **Good:**
  - Installing cvmfs + eessi stack rpms “just work” ;)
- **Improvement options:**
  - Create bash script for init in rpm (path to init on cvmfs will not expand until touched)
  - Proper recognition of Infiniband
    i. Seems fixed in OpenMPI 4.1
    ii. Discussing with archspec for archspec.interconnect
  - Document/simplify build environment for extending EESSI:
    i. Needed hand-holding for setting the right gentoo & easybuild configs
- **Open question:**
  - How to use / build stack with Intel compiler?

[Hugo]

Testing of pilot version 2021.06

- Needed to test some R packages … on a fresh VM …
  - Didn't want to install R, so got EESSI up and running*
  - Installed R packages (this included building some dependencies)
  - Using them failed

```
a4a: /lib64/libc.so.6: version `GLIBC_2.33' not found (required by
/cvmfs/pilot.eessi-hpc.org/2021.06/software/linux/x86_64/intel/haswell/softwa
re/GCCcore/9.3.0/lib64/libstdc++.so.6
```

⇒ need a linker wrapper for EESSI to build packages correctly

(*) did this on a Rocky 8.4 system which required to fix SELinux stuff (don't think it was that "complicated" before with CentOS or Ubuntu)

- Something to keep in mind for testing? Could also be related to the basic image being used.

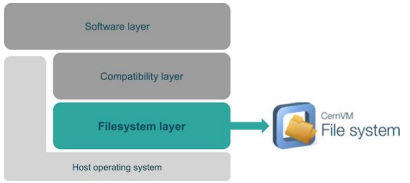
[Thomas]

EESSI-related meetings

- Oct 12th: monthly CernVM-FS coordination meeting [Bob]
  - CernVM Workshop 2022 (12-14 Sept 2022, NIKHEF): https://indico.cern.ch/event/1079490/
  - 2.9 to be released soon: some new features (especially for DUCC), performance improvements and bugfixes, support for some new platforms (SLES 15, Debian 11)
  - Discussion about using IP addresses vs DNS entries in the client configuration
    - Both have pros and cons
    - Adding both for every Stratum 1 is not the best idea either
    - Recommendation: use 5-10 reliably hosted Stratum 1 servers
  - CERN's main Stratum 1 serves tens of TBs per month
  - Setting up a highly available Stratum 1 pair: https://github.com/cvmfs-contrib/cvmfs-hastratum1

[Bob]

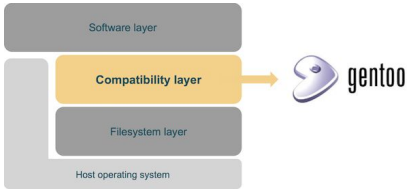
Progress update: filesystem layer



- Set up another Stratum 1 in our FENIX resources
  - Not added to the client configuration yet
- Terje has set up deb/yum repositories for hosting the client configuration packages
  - See infrastructure slide
  - We can also use it for storing CVMFS client packages for POWER/Arm, which we need for our containers; this will greatly reduce the container build times
- Fixed a small issue with the automated ingestion
  - It tried to reingest an already ingested tarball, due to GitHub connection issues

[Bob]

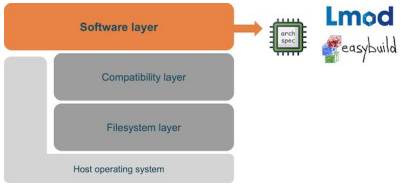
Progress update: compatibility layer



- No security updates required (as reported by Gentoo's `glsa-check` tool)
- Removed 2021.03 from the ReFrame tests running as GitHub Action

[Bob]

Progress update: software layer



- Some improvements for the `start_build_node_env.sh` script
  - Make sure that the temporary directory is available in the container (PR #139)
  - Check if the overlay's `upper` directory has support for extended attributes (PR #140)
- A `zen3` stack has been built on an AMD Milan node in Azure
- Due to changes in the new archspec version, we have to modify our detection scripts for the next pilot release; see issue #142

[Kenneth]

Infrastructure: updates

- Yum and apt repositories for our CVMFS configuration: http://repo.eessi-infra.org/eessi/
- Node is completely ephemeral, fetches data from github on creation and updates every hour
- Maintained as a terraform node, cattle, not pets, even for “core” servers
- Long term look at serving from S3?

[Terje]

Infrastructure: install EESSI config?

- Meta package for installing the repo ala EPEL ready
- No automation for publishing, so manually uploaded to repo server (ick)
- How to test?

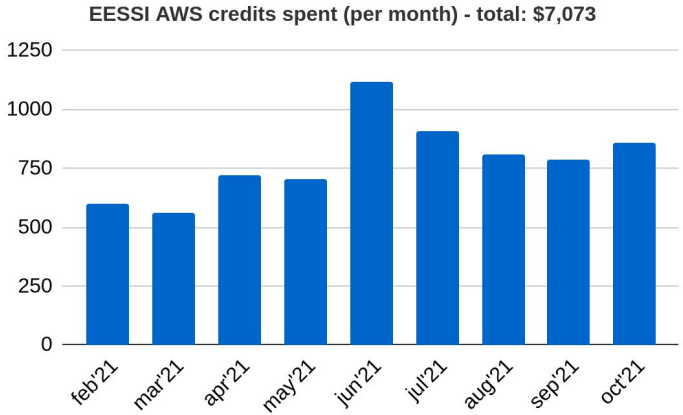
```
yum -y install http://repo.eessi-infra.org/eessi/rhel/8/noarch/eessi-release-0-1.noarch.rpm
yum update
yum -y install cvmfs-config-eessi
```

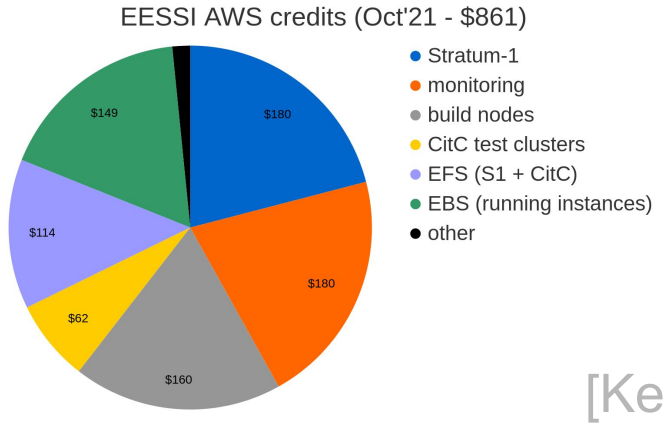
  And then you have a working cvmfs setup for EESSI. No meta package for deb yet.

[Terje]

Usage of sponsored AWS credits

- Sponsored credits ($25,000) are being put to good use!
- **Ask in #aws-resources Slack channel to get access!**
- In October ‘21: ~$861 worth of credits spent on Stratum-1, monitoring node, build nodes, ...
- ~$7,073 worth of credits spent in total
- Credits will expire on Jan 31, 2022!
    - We should use the remaining ones for some good purpose and try to apply for new ones

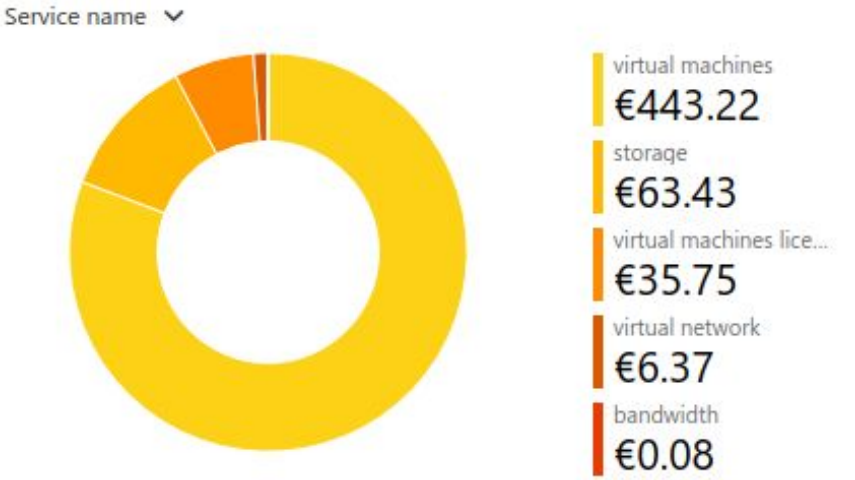


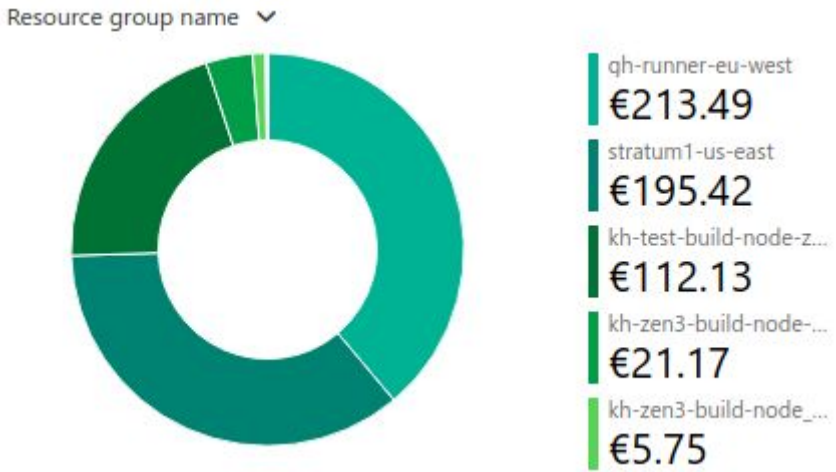


[Kenneth, Bob]

Azure sponsorship

- **Ask in #azure-resources Slack channel to get access!**
- In October ‘21: ~€549 worth of credits spent
- On Stratum 1, GitHub Runners, and AMD Milan build node





[Kenneth, Bob]

Update on EESSI journal paper

- Title: “**EESSI: A cross-platform ready-to-use optimized scientific software stack**”
- Submitted to special issue “New Trends in HPC: Software Systems and Applications” in “Software: Practice and Experience” journal (Wiley)
- Authors: Bob, Kenneth, Victor, Alan, Caspar, Thomas (proof-reading by Adam)
- Received reviews in mid August (overall fairly positive)
- Valuable comments and suggestions for improvements
- Discussed necessary changes and distributed work
- **Working on revised version due mid November: made quite some progress**
- No guarantee of final approval

[Thomas]

EESSI risk analysis

- Started looking into risks as part of the NESSI project (in Norway).
- All kinds of risks considered (availability, security, performance, organisational, …)
- First round + initial feedback collected, example:
  - [R1] Stratum 0 goes down (see also R27)
    - Likeliness - Low,
    - Impact - Low, can not add new packages
    - Mitigation: call Bob*, use S3 as storage backend, use CloudFront for distribution?, automated setup of Stratum 0, have replica running all time, backup of repository, monitoring

    (*) Ensuring that a select group of people has admin access to Stratum 0 would also help. That may imply moving S0 to a (commercial?) cloud environment where giving others admin access is not a problem w.r.t. site policies.
- Open to discuss with EESSI community (e.g., separate meeting or a shared document)

⇒ important to be aware of risks and to take appropriate mitigation measures for using EESSI in production

[Thomas]

FENIX call for proposals

- https://fenix-ri.eu/news/prace-icei-calls-proposals-call-7
- Last year's allocation will expire at the end of the year
- Alan updated last year's application form, and we reapplied for the same kind of resources:
  - Virtual machine for a Stratum 1
  - AMD EPYC build node, possibly with a GPU
  - 5TB of Swift object store for the Stratum 1
  - 36,000 node hours for performance and portability testing

[Alan]

Upcoming events

- EESSI talk at HPC System Testing Birds-of-a-Feather, SC21
  - November 16th, 2021
  - Presented by Caspar
  - Focused on testing the EESSI software stack (with ReFrame)
- Computing Insight UK (CIUK) 2021: https://www.scd.stfc.ac.uk/Pages/CIUK2021.aspx
  - December 9-10, 2021, Manchester (and online)
  - Jörg has submitted an abstract about the importance of reliable software installations, which will also cover EESSI a bit
  - Decision deadline: end of next week