EESSI meeting

January 7th 2021

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

Agenda

1. Quick introduction by new people
2. EESSI-related meetings in last month [Bob, Alan, Caspar, Robert]
3. Progress update per EESSI layer [Bob, Kenneth, Peter, Terje]
4. 2020.12 version of pilot repository: changes & status [Kenneth]
5. PRACE-ICEI / Fenix projects: LearnHPC & EESSI [Alan, Henk-Jan]
6. Updates on sponsorship by Azure/AWS [Henk-Jan, Bob, Kenneth]
7. EESSI consortium: status [Jaco]
8. Dell sponsorship [Jaco]
9. Next steps
10. Past & 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-related meetings

- CernVM-FS coordination meeting (Tue Dec 8th 2020) [Bob]

- EESSI and Magic Castle (Thu Dec 10th 2020) [Alan]

- Testing EESSI with ReFrame (Wed Dec 16th 2020) [Caspar]

- EESSI + HPC.NRW collaboration (Tue Jan 5th 2021) [Robert]

CernVM-FS coordination meeting

- Lessons learned w.r.t. reinstalling + upgrading a Stratum 1

- Mac support

- Config packages and repositories

  - Sites can only use one config repository

  - We should submit our config package to the [cvmfs-contrib config repo](#)

- Release candidate for CernVM-FS version 2.8 expected soon

- CernVM-FS tutorial as part of EasyBuild User Meeting

- CernVM-FS workshop (Feb 1-3) with presentation on EESSI (by Bob)

[Bob, Kenneth]

EESSI + Magic Castle

- Meeting with developers scheduled after LearnHPC Fenix resources granted

  - General discussion on development topics and agreement to collaborate

- Successful tests of Magic Castle + EESSI on Azure with Infiniband support, and on AWS with EFA support

  - $1000 resource credit from AWS for further testing and support of EFA fabric

- Successful tests also on Fenix infrastructure

  - Could consider leveraging these resources to support CI
    (low priority, preemptable queue)

[Alan]

Testing EESSI with ReFrame

- Requirement: test suite *should* run with minimal setup

  - Define baseline tests & allow sites to override

    (ReFrame test libraries / simple test inheritance)

- Main challenge: how to define #tasks / #tasks_per_node / #nodes generically?

  Either:

  - Fixed task count (e.g. MPI point-to-point)

  - Fixed node count + cores_per_node in config (not currently supported in ReFrame)

- Two variants for each test

  - System with native CernVM-FS (tag: native)

  - Containerized test (tag: container)

[Caspar]

Testing EESSI with ReFrame

- Test selection mechanisms required:

  - For architecture, e.g. gpu, cpu (tags or partition names)

  - For size: single_node, small, large (tags)

  - For length: short, long (tags)

- Issue: running container multiprocessing fails, because CernVM-FS cache clashes

  - ReFrame test that sets up alien cache

  - Wrapper around container that sets cache location per task

- Notes:

  https://github.com/EESSI/software-layer/wiki/Brainstorm-meeting-(Dec-16th-2020)--testing

[Caspar]

EESSI / HPC.NRW collaboration

- Meeting on Tue 5th 2021 (participants: 16 HPC.NRW, 9 EESSI)
- Topics:
  - Getting to know each other
  - Current state of EESSI
  - Goals/open tasks in EESSI and discussion of collaboration

- Initial collaboration potential/steps:
  - Testing of Pilot on clusters, feedback, improvement of documentation
- Next steps:
  - Meeting about "behind-the-scenes of EESSI"
    https://doodle.com/poll/7we33t98fphs8gbe

[Robert, Kenneth]

Progress update: filesystem layer
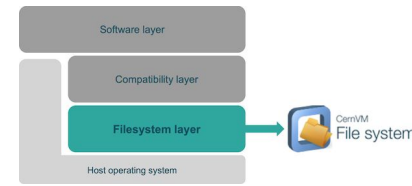
- Automatically generate macOS client configuration package using Github Action

- Github Action that tests the client packages (deb, rpm, pkg) for each commit

  - Install CernVM-FS client and cvmfs-config-eessi package, and make a default.local

  - Do an `ls` on the repository

- ~~Github Action for building client packages is currently broken (due to a Ruby update?)~~ ~~https://github.com/EESSI/filesystem-layer/issues/64~~ (fixed!)

- Reconfigured the automatic tagging and garbage collection on the pilot repository

  - Also wiped some older pilots

- We should think about how we are going to store the master key and resign the whitelist

 - Recommendation to use yubikey(s)

[Bob]

Progress update: compatibility layer
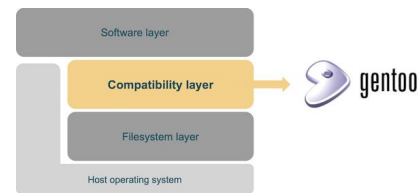
- Slightly different layout (extra `linux`/`macos` subdirectory under `compat/`)

- macOS - x86_64 works (using GCC not LLVM)

- macOS - Arm… Not yet. CVMFS works.

- POWER:
  - Bootstrap only works with 'non-RAP' profile, which means it's using the host's glibc
  - Developers are helping out to fix the issues with RAP, but it has been quiet for a while...
 - https://bugs.gentoo.org/755551

[Peter, Bob, Terje]

Progress update: software layer (1/3)
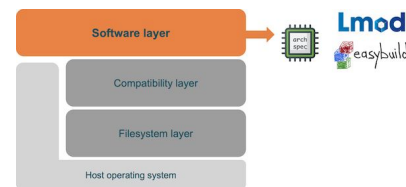
- EESSI-related enhancements/fixes in EasyBuild v4.3.2
  - experimental support for easystack files: https://docs.easybuild.io/en/latest/Easystack-files.html
  - also inject `-rpath` options for all entries in `$LIBRARY_PATH` in `RPATH` wrappers
  - significant speedups when installing lots of extensions (R, Bioconductor)
  - stop silently ignoring result of numpy test suite
  - fixes for Python and Perl easyblocks w.r.t. building with alternate sysroot

- Recent changes (already fixed in EasyBuild `develop` branch)
  - filter out duplicate paths in RPATH compiler wrapper
    (seems to fix problems with Paraview on a64fx)

- Open EasyBuild PRs:
  - patch CMake installation so it behaves correctly when using alternate sysroot (PR #2248)
  - correctly determine path to active binutils in TensorFlow easyblock (PR #2218)
  - make OpenBLAS easyblock aware of `--optarch=GENERIC` (PR #1946)

[Kenneth]

Progress update: software layer (2/3)
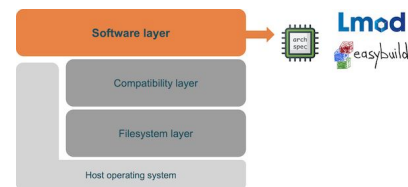
- Building for `aarch64/thunderx2` and `aarch64/a64fx` (@ Isambard)
  - have to use `--containall` option when starting Singularity container,
    to avoid problems due to forced mount of `/etc/localtime` (fixed in more recent Singularity?)
  - … and then bind mount specific things like `/dev/full` and `/proc`
    to avoid problems when installing software (e.g. R packages)
  - Very strict limit on # open files reveals some bugs with Qt5 and grpcio (TensorFlow),
    to be fixed in EasyBuild

- Failing numpy test in `aarch64/generic` (may be OpenBLAS problem?),
  see https://github.com/EESSI/software-layer/issues/55

- Lmod caches are now in place for all EESSI module files (one cache per CPU arch)
  + init script sets custom Lmod config to use them via `$LMOD_RC`
  (fixes issue #10)

[Kenneth]

Progress update: software layer (3/3)
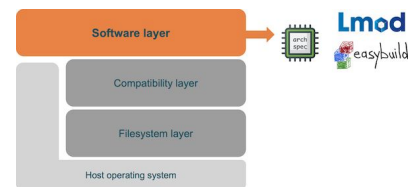
- Refactored `init` script
  - separate script to define `$EESSI_*` environment variables (`eessi_environment_variables`)
  - separate init scripts to be used by Magic Castle (see `2020.12/init/Magic_Castle`)
  - no changes w.r.t. setting up environment to use EESSI:
    `source /cvmfs/pilot.eessi-hpc.org/latest/init/bash`

- init script now adds `$EPREFIX/usr/bin` to `$PATH`;
  This fixes problems with:
  - compiling software with GCC (now using Gentoo's `ld`, fixes issue #26)
  - `curl` (certificates are in different places in different Linux distros, fixes issue #46)
  - `python` (python command used at installation should also be used at runtime, fixes issue #52)

[Kenneth]

EESSI pilot repository

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

2020.12 version of pilot software stack

- Software:

    - `foss/2020a` toolchain (GCC 9.3, OpenMPI 4.0.3, OpenBLAS 0.3.9, FFTW 3.3.8)

    - GROMACS 2020.1, OpenFOAM v8 + v2006, R 4.0.0 + Bioconductor 3.11, TensorFlow 2.3.1

    - **OSU-Micro-Benchmarks 5.6.3** *(new!)*

- Targets (Linux only):

    - `aarch64/generic, x86_64/generic`

    - `x86_64/intel/{haswell,skylake_avx512}, x86_64/amd/zen2`

    - `aarch64/graviton2,` **`aarch64/thunderx2`** *(new!)*

- Also: Lmod cache, init script for Magic Castle, using commands provided by compat layer

- TODO: GPU-capable installations for GROMACS + TensorFlow

[Kenneth]

PRACE-ICEI / Fenix projects

- EESSI project (PI: Henk-Jan)

  - Project granted

  - Core hours available for performance and scalability benchmarking

  - Contact Henk-Jan if you want access

- LearnHPC project (PI: Alan)

  - At least 2 use cases in the pipeline

  - Stress testing will do no harm

  - Generally successful tests of Magic Castle,

    some flaky behaviour of NFS that needs investigation

  - Article with Fenix published

[Henk-Jan, Alan]

Update on sponsorship by Azure/AWS

- AWS: status
  - Credits available to several individuals (Kenneth, Bob, Terje)
  - $1000 for EFA support in Magic Castle + EESSI (Alan)
  - Legal technicalities almost finished w.r.t. group project (lawyers, lawyers, lawyers)

- Azure resources for hands-on CernVM-FS tutorial at EasyBuild User Meeting, see https://easybuild.io/eum/#cvmfs-tutorial

- Azure legal technicalities still ongoing, may go via SURF rather than RUG

[Henk-Jan, Bob, Kenneth]

EESSI consortium: status

- Consortium:
  an association of companies etc, especially one formed for a particular purpose
    (The Collins English Dictionary)

- Slow start during the holiday season

- We are looking for volunteers to lead the Board of Directors of EESSI.
    - Today we already have one volunteer, the CTO of the University of Groningen

- The plan is to have a team starting with the goals etc. by the end of January

- Renaming "European" in EESSI to something else: poll is inconclusive...

[Jaco]

Dell sponsorship

- Dell Technologies (HQ - Texas) Product Marketing is interested to sponsor this project, next internal meeting is on January 20th

- We asked $$ budget to make stickers, T-shirts etc. for EESSI and to update the website, logos and some other stuff

- In return, they asked to write a whitepaper about EESSI and what it solves.

- Dell Technology HQ - will write this white paper, after interviewing a number of key players and our spokesperson 😊

[Jaco]

Next steps

- Improve support for "easystacks" in EasyBuild

- More organised set of issues: labels, project dashboards per topic?

- **Testing & continuous integration**
  - More & better CI checks for EESSI layers (leverage software demos?)
  - Tests for software layer via ReFrame (smoke tests, apps, benchmarks, …)

- Documentation: build nodes, "native" CernVM-FS access, HPC clusters, ...

- **Automatic deployment of software to EESSI repository**
  - Triggered by pull requests in GitHub
  - Bots negotiating with each other?
  - Leveraging both cloud resources in Azure/AWS + resources at HPC sites

- Use `foss/2020b` toolchain for next pilot revision?

Past events https://github.com/EESSI/docs/tree/master/talks

- Kenneth's talk at HPC Champions workshop (Archer, UK)

    - Tue Dec 15th 2020
    - see https://github.com/EESSI/docs/tree/master/talks/20201215_HPC_Champions_UK

Upcoming events

- EasyBuild User Meeting (virtual): week of 25-29 Jan 2021
  - https://easybuild.io/eum
  - Talks on CernVM-FS, Gentoo Prefix, EasyBuild, Lmod, ReFrame, Magic Castle, LearnHPC, ...
  - **Talk by Bob on EESSI** (Tue Jan 26th 2021 at 12:00 UTC)
  - **CernVM-FS tutorial**, co-org. by Kenneth/Bob, CernVM-FS developers, Azure HPC, Compute Canada
  - **ReFrame tutorial**, organised by ReFrame developers
  - **<u>Registration is required (especially for tutorials!)</u>**

- CernVM-FS workshop (virtual): 1-3 Feb 2021:
  - https://indico.cern.ch/event/885212
  - **Incl. talk by Bob on EESSI** (Wed Feb 3rd 2021 at 14:00 UTC)

- HPC devroom at FOSDEM'21 (virtual): Sat-Sun Feb 6-7 2021
  - https://fosdem.org/2021/schedule/track/hpc_big_data_and_data_science
  - **Incl. talk by Bob on EESSI** (Sat Feb 6th 2021 at 14:30 UTC)