EESSI meeting

May 6th 2021

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

Agenda

1. Quick introduction by new people
2. EESSI-related meetings in last month [Bob, Kenneth, Thomas]
3. Update on CZI grant “Essential Open Source Software for Science” [Alan]
4. Progress update per EESSI layer [Bob, Peter, Kenneth]
5. 2021.03 version of pilot repository: status [Kenneth]
6. Build nodes experience report [Thomas, Axel]
7. Testing with ReFrame [Caspar]
8. AWS/Azure update + infrastructure in AWS [Kenneth, Terje]
9. Focus points in coming weeks/months
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

- April 13th: Monthly CernVM-FS coordination meeting (attended by Bob)
  - Very short meeting, main (relevant) news: version 2.8.1 was released, solves a few bugs
- April 23rd: Brainstorm about setting up software stacks on new clusters

  see https://github.com/EESSI/meetings/wiki/Brainstorm-software-stacks-new-clusters-Apr-23-2021
- April 30th: NESSI - EESSI coordination meeting

  (Thomas, Bob, Kenneth, Alan, Terje, Peter, Caspar, Axel, Andreas, Dan)
  - NESSI development phase started May 2021 (1y, ~24 PMs of effort)
  - Agenda: status & plans for NESSI & EESSI, how to coordinate effort, EESSI “road map”, focus points for NESSI (ReFrame, automation, monitoring)
  - https://docs.google.com/document/d/1awxlYTIXYj-6LuopRjR1ifj7d2ciNJL9Oj7TdXdgdmM

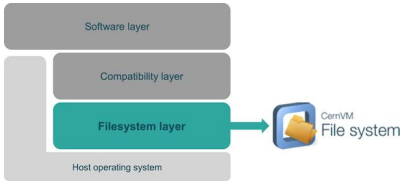
[Bob, Kenneth]

Application for CZI grant

- “Essential Open Source Software for Science” (Cycle 4)
  - See https://chanzuckerberg.com/eoss
  - Software projects that are essential to biomedical research
- Proposal with University Medical Centre Groningen
  - Focus on rare diseases and supporting biomedical workflows via EESSI
  - “Community Champion” to act as a gateway to community:
    outreach, usage, tutorials, docs, requirement gathering,...
  - Couple to (funded) developer within EESSI to translate their needs into something actionable, then implement these
- “Not selected to move forward to the full application stage”
  - No feedback provided 😔😔😔

[Alan]

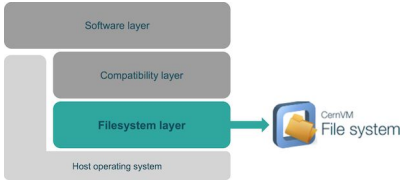
Progress update: filesystem layer



- New patch release (0.3.1) to trigger the creation of a moving “latest” release
  - https://github.com/EESSI/filesystem-layer/releases/tag/latest
- PR #83 to make use of new config packages in container definitions and scripts
  - Also adds a workflow to automatically build and publish containers
  - Now using GitHub Container Registry instead of Docker Hub
  - One multi-arch image for `x86_64, aarch64, ppc64le`, built using QEMU and Docker Buildx
  - Multi-stage Dockerfile to prevent build packages from ending up in client image
- Idea to use S3 storage for (private) Stratum 1 in AWS
  - Allows us to easily use AWS CloudFront as a cache for clients without a local Squid cache
  - Edge locations around the globe
  - Ansible role does not support this
- Still have to fetch and set up the yubikeys (Bob)…
- Bob is working on documentation, see: https://github.com/EESSI/docs/pull/69

[Bob, Kenneth]

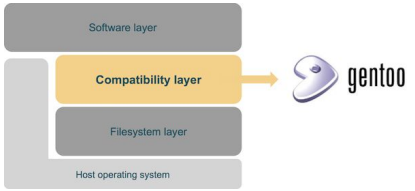
CernVM-FS bug found by ComputeCanada



- “Large scale corruption of a frequently used file in CVMFS”
- In-place update of glibc (`$EPREFIX/lib64/libc-2.30.so`) caused trouble
- Significant amount of clients got corrupt version of this file!
- CernVM-FS developers working on (non-trivial) fix
- Workaround possible via symlink to avoid actual in-place update
- All details in https://sft.its.cern.ch/jira/browse/CVM-2001

[Kenneth]

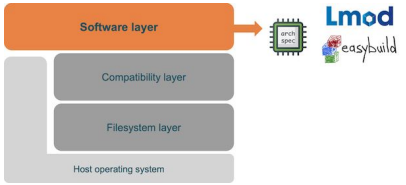
Progress update: compatibility layer



- Test suite rewritten to make use of ReFrame instead of pytest
  - https://github.com/EESSI/compatibility-layer/pull/94
- Automatically build and publish containers for bootstrapping Gentoo Prefix
  - https://github.com/EESSI/compatibility-layer/pull/98
- CI currently broken, due to (once again…) issues with Lua libraries
  - https://github.com/EESSI/compatibility-layer/issues/99
- TODO: Gentoo security updates in 2021.03 for OpenSSL, SQLite, Python...

[Bob, Peter, Kenneth]

Progress update: software layer



- Build script updated for EasyBuild v4.3.4 (see PR #85)
- Arrow, Spark, IPython added (see PR #91 + PR #94)
- Qt5 broken for clients with Linux kernel older than 3.17 (see issue #99)
- `amd/zen2` in 2021.03 pilot version installed with EasyBuild v4.3.3 (not v4.3.4) (issue #102)
- Work by Alan on creating different “view” via separate module tree
  - Via “`eb --module-only`”, several fixes needed in EasyBuild…
  - See also PR #100 + issue #101
- Proposal by Caspar to add Horovod (for testing TensorFlow multi-node)
  - See https://github.com/EESSI/software-layer/pull/104
- Some progress on speeding up installation of R by installing extensions in parallel…
  - See https://github.com/easybuilders/easybuild-easyblocks/pull/2408

[Kenneth]

EESSI pilot repository

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

NOT FOR PRODUCTION USE!

2021.03 version of pilot software stack

Current status:

TODO: remove 2020.12 pilot version?

- Compatibility layer in place for `x86_64` + `aarch64`

  (`ppc64le` on hold due to Gentoo Prefix bootstrap issue)

- Target CPUs:
  - `{aarch64,x86_64}/generic`
  - `intel/{haswell,skylake_avx512}`, `amd/zen2`, `aarch64/graviton2`
- Software: Bioconductor (R), GROMACS, OpenFOAM, TensorFlow, **Spark, IPython**, ...
- Init script updated
- Docs updated: https://eessi.github.io/docs/pilot
- GPU installations: on hold (cfr. discussion with NVIDIA on CUDA)

[Kenneth]

Build nodes experience report

2021.03 Haswell stack on NREC (by Axel)

- Followed the build instructions found here:
  - https://eessi.github.io/docs/software_layer/build_nodes
- Need: 50GB disk space
- Local cloud VM only has 20GB on /
- Need extra volume of 50GB attached to VM
- Then environment variables need to be set to bind /tmp in the build container to the attached volume.
  - Opened PR to add these instructions: https://github.com/EESSI/docs/pull/77

[Thomas, Axel]

Build nodes experience report

2021.03 Skylake stack on Saga (by Thomas)

- very slow (1/5 or so even using a full node with 40 cores)
  - would be great to understand why it was so slow
- attempt to use `/dev/shm` did not speed up build
- sometimes only few cores were used, sometimes more than 40
- sources for one package DB... weren't available temporarily
- building on compute nodes within batch jobs might benefit from a more incremental procedure or more inbuilt fault tolerance
- would be nice to have some reference values for build times
  - alternatively some progress info (10%, 20%, ... done) could be useful

[Thomas, Axel]

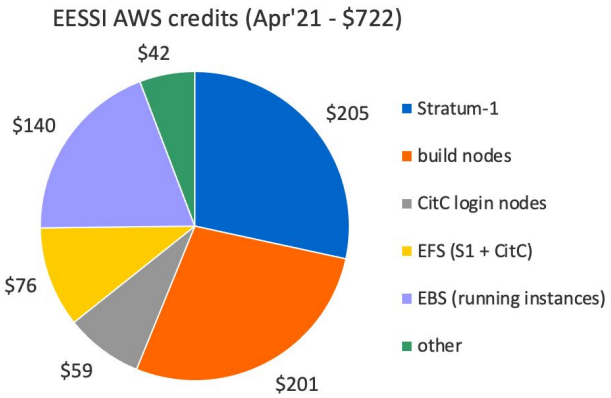
Testing with ReFrame

- Current status:
  - PR for GROMACS: https://github.com/EESSI/software-layer/pull/65
  - PR for TensorFlow: https://github.com/EESSI/software-layer/pull/106
  - Docs: https://eessi.github.io/docs/software_testing
- Planning brainstorm + hackathon to expand, also with NESSI
  - Agree on test selection (tags, programming environments, modules)
  - Agree on fixed test sizes, max runtimes (#nodes etc)
  - Agree on native vs EESSI-container based tests
  - Shortlist of new tests to be created + hackathon
- **Who's in?**

[Caspar]

Update on sponsorship by Azure/AWS

- Sponsored credits ($25,000) are being put to good use!
- In Mar'21: ~$722 worth of credits spent on Stratum-1, build nodes, EB testing, ...
- **Ask in #aws-resources Slack channel to get access!**



- No follow-up meetings planned for now…
- Blog post on CernVM-FS tutorial:

  https://techcommunity.microsoft.com/t5/azure-compute/azure-hpc-powers-cernvm-fs-tutorial/ba-p/2261437

[Kenneth]

AWS infrastructure: status

- Bob has used the script a bit, works well given >1GB of RAM...
- Slack bot interface being worked on, albeit very slowly...
- Route53 up and running, both for infra.eessi-hpc.org and eessi-infra.org
- monitoring.eessi-hpc.org is on its way.

  Zabbix + Grafana for Stratum servers and the wider EESSI infrastructure
- **Ask in #aws-resources Slack channel to get access**

[Terje]

Focus points in coming weeks/months

- Target architectures: `x86_64` and `aarch64` (cfr. 2021.03 pilot)
  - `x86_64`: `intel/{haswell,skylake_avx512}` + `amd/zen2` is sufficient?
  - `aarch64`: only `generic` and `graviton2` for now?
  - **Can all be tackled via AWS EC2 instances!**
  - `ppc64le` on hold due to Gentoo bootstrap issue + limited interest?
- Software: additional packages can be added if there are interesting use cases
- **Primary focus should be on automation, testing, monitoring, documentation, ...**

[Terje]