EESSI meeting

March 4th 2021

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

Agenda

1. Quick introduction by new people
2. EESSI-related meetings in last month
3. S4 NeIC project proposal [Thomas]
4. Experiences with 2020.12 pilot repository [Alan, Robert]
5. Progress update per EESSI layer [Peter, Bob, Kenneth, Terje, Dennis]
6. 2021.02 version of pilot repository: status [Bob, Peter, Kenneth]
7. Updates on sponsorship by Azure/AWS [Henk-Jan, Bob, Kenneth]
8. Call to action for 2021.02 pilot
9. Past & upcoming events

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

- EESSI ReFrame meeting with AWS (Feb 12)
  - Extensive discussion on testing & ReFrame, predicting system performance, ...
- EESSI compatibility layer brainstorm (Feb 16)
  - Coordinate efforts w.r.t. compatibility layer (incl. security updates)
- EESSI pilot 2021.02 kickstart meeting (Feb 23)
  - Coordinate efforts w.r.t. 2021.02 version of pilot repo
  - https://github.com/EESSI/meetings/wiki/EESSI-pilot-2021.02-kickstart-meeting

S4 NeIC* project proposal

- S4 - Scientific Software Stacks as a Service. Main goals/activities:
  1. **Help make the EESSI solution ready for production use.**
  2. Develop "Nordic" customisations to the EESSI solution.
  3. Setup necessary software distribution infrastructure in the Nordic region.
  4. Train system administrators and support staff to operate infrastructure
  5. Outreach, user engagement and user training.
- Two year development project. Might start in spring 2022. Total effort about 100 PMs.
- Hopefully will involve Nordic (NO, SE, EE, IS, FI, DK) and other partners (CH, BE, NL).
- If you have a "black belt" in proposal writing, please contact Thomas :)

(*) Nordic e-Infrastructure Collaboration, https://neic.no

[Thomas]

Experiences with 2020.12 pilot repository

- Testing installing GPU-capable stuff on top of EESSI 2020.12 pilot repo
  - Software built on top of CUDA needs to find `libcuda.so.1` (on the host!)
  - Historically required more libraries but may no longer be necessary
  - See https://github.com/EESSI/compatibility-layer/issues/71
- Testing use of fast interconnect (Soft-RoCE support in Magic Castle)
  - UCX must be configured differently:
    `--with-sysroot=$EPREFIX --with-rdmacm=$EPREFIX/usr`
  - Libfabric also has `--with-sysroot` option
  - **We should have additional checks for such critical packages!**
  - See https://github.com/EESSI/software-layer/issues/63

[Alan]

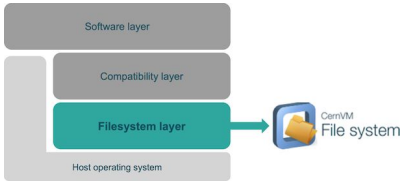
Experiences with 2020.12 pilot repository

Testing by HPC.NRW partners:

- **CLAIX18-Cluster** @ RWTH Aachen (Skylake-SP+OmniPath, CentOS), by Marcus Wagner
  - with Singularity, single-node tests with OpenFOAM
  - feedback: tester was astonished about small size of local storage required, no problems reported
- **Noctua-Cluster** @ PC2 Paderborn (Skylake-SP+OmniPath, CentOS 7.8), by Robert Schade
  - with Singularity, multi-node OSU-benchmarks
  - feedback: probably not expected: directories for Pilot can't be located on Lustre-fs (FUSE problem), several MPI warnings but peak bandwidth was achieved
- **Openstack-VMs** @ HHU Münster, by Sebastian Potthoff
  - via Singularity
  - feedback: no problems reported
- **Pleiades** @ Wuppertal, by Martin Errnest
  - with direct CernVM-FS since they have many high-energy physicists
  - feedback: no problems reported

[Robert]

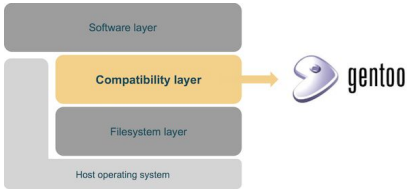
Progress update: filesystem layer



- New CernVM-FS client configuration packages for EESSI
  - https://github.com/EESSI/filesystem-layer/releases/tag/v0.3.0
  - Additional package type: tarball
  - “Static” configuration, not using the CernVM-FS configuration repo anymore!
  - Still possible to add repos without having to reconfigure/update clients
  - Proxy will be automatically set to `DIRECT` when ‘`CVMFS_CLIENT_PROFILE=single`’
  - cvmfs-config repo will stay available for a while
  - TODO: update all scripts, container recipes, etc.
- New (very small) repo `ci.eessi-hpc.org` for CI testing
- Work in progress: adding our config to the `cvmfs-config-egi` package
- TODO: set up a Stratum 1 (and proxy?) in AWS. **Volunteers?**

[Bob]

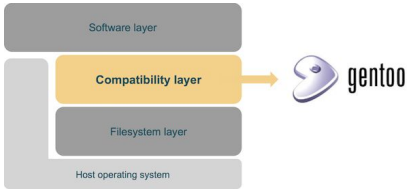
Progress update: compatibility layer



- Security updates done in 2020.12 compat layer for all architectures (Python updates)
- Gentoo Prefix snapshot + bootstrap script + packages updated for 2021.02 version of pilot repo
- `/opt/eessi/lib` path injected via custom configuration for glibc (but didn't actually work?!)
- gentoo-overlay repository deforked and cleaned up (https://github.com/EESSI/gentoo-overlay)
  - Now using Lmod from upstream Gentoo (but needs to be unmasked for `aarch64`/`ppc64le`)
  - Automatically generated set files by create-pull-request GitHub action
- **We'll probably redo the compat layer as 2021.03 once known issues are fixed**
- Check status of compatibility layer in GitHub Actions (CI)
  - Test use of `startprefix` command for x86_64, aarch64, ppc64le
  - Using QEMU magic for non-x86_64 installations on x86_64 VM in GitHub Actions \o/
  - See https://github.com/EESSI/compatibility-layer/actions/workflows/pilot_repo.yml

[Peter, Bob]

Experience report on building compat layer



Novice install attempt of EESSI compat layer for `aarch64`

(Details: compatibility-layer #82)

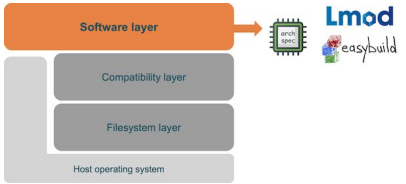
- Documentation is clear if underlying mechanisms are known (Git, Ansible, SSH).
- Tackling upcoming issues requires deeper knowledge about Gentoo system setup. (encountered build system configuration / missing packages / missing keywords)
- Integration environment is currently handled externally (VM creation, result ingestion).

General notes:

- Process is easy to follow, but internal mechanisms are not understandable e.g. when silently built inside a Singularity container.
- Setup of build machine could be considered, with defined versions and resources (e.g. Ansible3)

[Dennis]

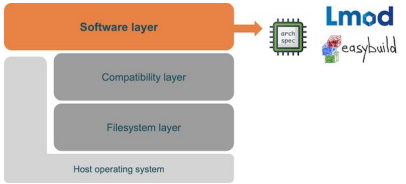
Progress update: software layer (1/2)



- Build container + build script updates for `ppc64le` (by Bob)
- Software build script was enhanced and updated
  - Also using `{linux,macos}` subdirectory in `2021.02/software/` (like in compat layer)
  - Now uses EasyBuild hooks to customize installations (CGAL, fontconfig, UCX)
  - Updated for EasyBuild v4.3.3 (released on Feb 23rd)
- Check status of software layer via GitHub Actions (CI) **[work-in-progress]**
  - Using easystack file to specify pilot software stack
  - See https://github.com/EESSI/software-layer/pull/74
- Minimal additional software added to pilot: ReFrame, code-server, RStudio-Server

[Kenneth]

Progress update: software layer (2/2)

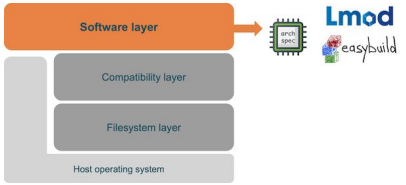


TODO:

- Pull together notes to properly document procedure to set up a build node, see https://github.com/EESSI/docs/issues/50 (follow the breadcrumbs…)
- **Software installations for different CPU targets for 2021.02 pilot (volunteers?)**
  - Test builds were done for A64FX and POWER 8+9, but need to be redone…
  - Fix problems with numpy tests (aarch64) and TensorFlow (POWER)
- Update init script for 2021.02
  - Changed path for Lmod installation
  - Include both `$EPREFIX/bin` and `$EPREFIX/usr/bin` into `$PATH`

[Kenneth]

Progress update: infrastructure repo



- We have a new GitHub repo! https://github.com/EESSI/infrastructure
- We support both dynamic (ad-hoc) infrastructure and static (fixed) infrastructure.
- *Dynamic / Ad-hoc* is personal, *static / fixed* is for 24/7/365 nodes run by EESSI
- Dynamic: “I want to a large aarch64 build node” or “I want to build the compat layer”
- Static: “I want to have a persistent login node” or “I want a Stratum 1”
- Currently only targets AWS, no DNS (delegated subdomain), users via SSH pubkeys in GitHub!
- Uses Terraform + Ansible under the hood so very extensible and with multi-provider support
- Initial version by Terje: https://github.com/EESSI/infrastructure/pull/7

[Terje]

EESSI pilot repository

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

NOT FOR PRODUCTION USE!

2021.02 version of pilot software stack

Current status:

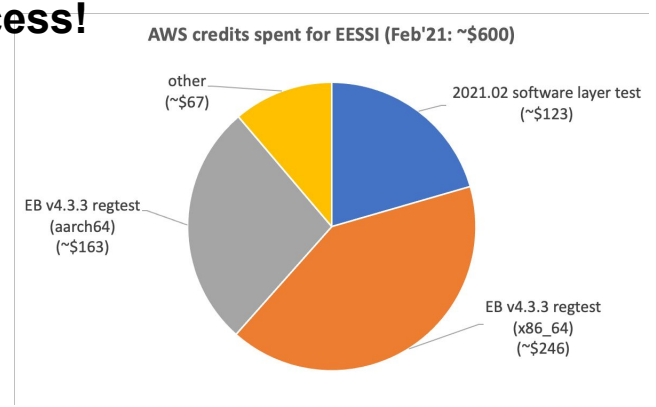
- Only compatibility layer in place (for `x86_64`, `aarch64`, `ppc64le`)
  - May need to be redone to actually get /opt/eessi/lib injected via custom glibc configuration…
- Software layer:
  - Same CPU targets: generic (x3), Haswell, Skylake, Rome, Graviton 2, ThunderX2, A64FX, POWER9
  - Same software: Bioconductor, GROMACS, OpenFOAM, TensorFlow

    (+ ReFrame, code-server, RStudio-Server)
- GPU support: (still) unclear if we're allowed to redistribute a full CUDA installation
  - Need to reach out to NVIDIA contacts are make it clear what we're doing
  - Figure out fallback approach if we can only redistribute the runtime libraries

[Kenneth]

Update on sponsorship by Azure/AWS

- Sponsored credits ($25,000) are being put to good use!
- In Feb'21: ~$600 worth of credits spent on throwaway Slurm clusters, testing, ...
- Working on smooth(er) way to give access + documentation
- **Ask in #aws-resources Slack channel to get access!**



- No new info on potential sponsorship
- Planned meeting is being replanned...

[Henk-Jan, Bob, Kenneth]

Call to action

- Setting up additional Stratum-1 + proxy server(s) in AWS
  - **Volunteers?**
- Building 2021.02 software layer for different targets
  - For x86_64 (generic, haswell, skylake, zen2)
  - For aarch64 (generic, graviton2, …) + ppc64le (generic, power9)
  - Necessary changes to software build script already done
  - **Volunteers for setting up build nodes + babysitting things?**
  - Report problems, provide feedback, help with getting whole process documented
- Additional stuff: setting up monitoring, test scripts, etc.

Past + upcoming events

- EESSI presentation at HEP Software Foundation Packaging Meeting
  - Wed Feb 24th 2021, by invitation (Bob + Kenneth)
  - Very similar to earlier presentations (see CernVM-FS workshop talk)
  - Good follow-up discussion + concrete suggestions on technical aspects
- Upcoming:
  - CernVM-FS coordination meeting (Tue March 9th)
  - *(no EESSI presentations currently planned)*