EESSI meeting

February 4th 2021

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

Agenda

1. Quick introduction by new people
2. EESSI-related meetings in last month [Bob, Kenneth]
3. CernVM-FS tutorial [Bob, Kenneth]
4. Progress update per EESSI layer [Bob, Kenneth]
5. 2020.12 version of pilot repository: changes & status, testing [Kenneth, Caspar]
6. Updates on sponsorship by Azure/AWS [Henk-Jan, Bob, Kenneth]
7. Test cluster in AWS [Kenneth]
8. Project proposals: NESSI & S4 [Thomas]
9. EESSI consortium updates [Jaco]
10. Next steps
11. 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 behind-the-scenes (Jan 19th) [Bob, Kenneth]
- CernVM-FS coordination meetings (Jan 12th, Feb 3rd) [Bob, Kenneth]
- EasyBuild User Meeting (Jan 25-29) [Kenneth, Bob]

EESSI behind-the-scenes presentation

- By Bob, Kenneth, Terje
- By request of HPC.NRW consortium
- Very different from introductory EESSI presentation, different focus
- Topics:
  - Current status + plans / ideas going forward
  - Details on how current pilot repository was set up
  - Overview of things we want to do next...
- **Slides + recording available!**

  https://github.com/EESSI/docs/tree/master/talks/20210119_EESSI_behind_the_scenes

[Bob, Kenneth]

CernVM-FS coordination meetings

- CernVM-FS 2.8.0 is released (includes some useful enhancements)
- Planned developments in 2021:
  - Gather feedback on `cvmfs_server enter` (looks promising w.r.t. publishing!)
  - Improvements to gateway-publisher workflow (we probably need this…)
  - Support to let clients prefetch directories to improve startup times
- Recommendation to *not* use a CernVM-FS configuration repository, assuming all our repos are from the same domain
  - There can be only 1 conf. repo active at a time (hard limitation in CernVM-FS)...
  - By using one master key, you can still add new repos without reconfiguring the client
  - Alternative: get ourselves into `cvmfs-config-default` package!

[Bob, Kenneth]

EasyBuild User Meeting

- 6th year in a row, this time **over 125 people** registered!
- Mix of talks about (sites using) EasyBuild and other (somewhat related) projects
- Including talks about EESSI (by Bob), CernVM-FS, Gentoo Prefix, Lmod, ReFrame, Cluster-in-the-Cloud, ...
- Plus 2 tutorials: CernVM-FS and ReFrame
- **All info (incl. links to slides + recordings) via https://easybuild.io/eum21**

[Kenneth]

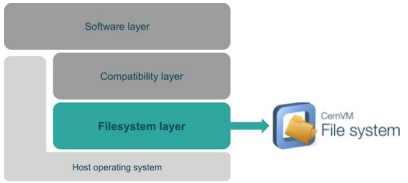
CernVM-FS tutorial at EUM'21

- Organised by Bob & Kenneth, with help from Axel + CernVM-FS community
- Introductory talk by Jakob Blomer (CERN, lead CernVM-FS developer)
- 4 tutorial sessions: ~1h each, demo-style, ramp up to full CernVM-FS setup
- Azure cloud resources for hands-on **sponsored** by 

- ~30 attendees, very positive feedback!
- Tutorial website available at https://easybuild.io/eum/#cvmfs-tutorial
- All sessions recorded!
  https://www.youtube.com/playlist?list=PLhnGtSmEGEQg8fY5t6nfjxGOYTfueDHwM

[Bob, Kenneth]

Progress update: filesystem layer

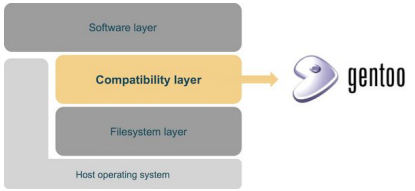


- Some issues with Stratum 1 at UiO last month, (again) shows need for proper monitoring
  - Replica had to be rebuilt from scratch, probably due to issues with underlying storage
  - Possible/easy first step for monitoring: https://cvmfs-monitor-frontend.web.cern.ch
- Client and build containers for `ppc64le` (via https://hub.docker.com/u/eessi)
- Renamed the client containers, since it does not depend on the pilot version:

  `docker://eessi/client-pilot:centos7-$(uname -m)` ~~`-2020.12`~~
- TODO: improve the client packages
  - Set default proxy?
  - Re-use the master key for all our repos
  - Also provide tarball
  - Stop using CernVM-FS configuration repository

[Bob]

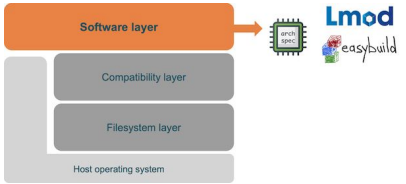
Progress update: compatibility layer



- Compatibility layer for `ppc64le` available in `2020.12`
- TODO: upstream Gentoo's new slotted Lua versions not usable in prefix yet
- Multiple security updates (39 counted) in Jan'21
  - Glibc 2.32-r5 unaffected ; Python fixed (for x86_64)
  - TODO: structure security updates
- TODO: collapse `gentoo-overlay` repository into `compatibility-layer`?
- Plan meeting to address the open issues shortly

[Peter, Bob]

Progress update: software layer



- Build script (cleaned up +) updated for 2020.12 pilot revision + EasyBuild v4.3.2
- Added software installations optimized for POWER9 (Bob) and Fujitsu A64FX (Kenneth)
- TODO:
  - Get EESSI-related PRs to EasyBuild merged
    (easystack files, CMake, TensorFlow, failing numpy test on aarch64, …)
  - Find access to better POWER9 resources (less restricted/oversubscribed)
  - New revision of EESSI pilot repository, using (also?) `foss/2020b` toolchain

[Kenneth]

EESSI pilot repository

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

NOT FOR PRODUCTION USE!

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

- Targets (Linux only):
  - `aarch64/generic`, `x86_64/generic`
  - `x86_64/intel/haswell`, `x86_64/intel/skylake_avx512`, `x86_64/amd/zen2`
  - `aarch64/graviton2`, `aarch64/thunderx2`, **`aarch64/a64fx`** *(new!)*
  - **`ppc64le/power9le`** *(new!)* *(TensorFlow is still missing...)*

- TODO: GPU-capable installations for GROMACS + TensorFlow (after we figure out CUDA)

[Kenneth]

Testing 2020.12 EESSI pilot

Goal: ‘turnkey’ test solution

- GROMACS reframe test (Prace benchmark case A)
  - GromacsBase: fully generic (sanity check etc)
  - GromacsSizedTests: single node, 4 node, 10 node => not generic
    - Can be made generic with requested feature https://github.com/eth-cscs/reframe/issues/1709
  - GromacsNative: fully generic
  - GromacsContainer: generic, except SHAREDSPACE & LOCALSPACE scratch dirs in shared_alien_cache_minimal.sh
- TODO: documentation (creating tests, running test suite)

[Caspar]

Testing 2020.12 EESSI pilot

- Want to try?
  - Clone https://github.com/casparvl/software-layer/blob/gromacs_v2 or check https://github.com/EESSI/software-layer/pull/65 (also for instructions)
  - Create your own reframe config (.../reframe/config/settings.py)
  - Adapt *self.num_tasks_per_node* in *gromacs.py*
  - Container run only: adapt *shared_alien_cache_minimal.sh*
    - *SHAREDSPACE* = scratch directory, shared between nodes
    - *LOCALSPACE* = local scratch
  - Run in .../tests/reframe:
    - *reframe --config-file=config/settings.py --checkpath eessi-checks/applications/ -r -v -t container -t single*
    - *reframe --config-file=config/settings.py --checkpath eessi-checks/applications/ -r -v -t native -t single*

[Caspar]

Update on sponsorship by Azure/AWS

- AWS:
  - **We have an EESSI account with $25,000 of credits \o/**
  - Ongoing: tuning the rights to the resources for EESSI members
  - TODO: document how to get access to AWS resources

- Azure legal technicalities still ongoing…
  - next follow-up meeting early March’21

[Henk-Jan, Bob, Kenneth]

Ideas for leveraging AWS resources

- Additional CernVM-FS Stratum 1 server(s) (with CDN?)
- Leveraging S3 for direct client access to the repository
- Building for + testing with different CPU architectures (Intel, AMD, Arm64)
- Automatic build and deployment infrastructure + CI
- Test clusters for hands-on demo’s
- Monitoring the EESSI infrastructure
- Sources mirror for EasyBuild
- Training EESSI project members (CernVM-FS, etc.)

[Henk-Jan, Bob, Kenneth]

Test cluster in AWS

CLUSTER IN THE CLOUD

aws

- **Throwaway** Slurm test cluster created with Cluster-in-the-Cloud in AWS
- Login node + 16 compute nodes (CentOS 8)
- 4 different node types:
  - Intel Haswell, Intel Skylake-SP, AMD Rome, AWS Graviton 2 (Arm64)
  - Each with 4 cores, ~8GB RAM
  - Shared home directory (NFS)
- Account available on request, contact Kenneth (Slack, email)
- **Only be available for a while, planning to trash it on Thu Feb 11th (maybe earlier)!**
- Documentation available at https://github.com/EESSI/docs/wiki/Throwaway-Slurm-cluster-in-AWS-(Feb'21)
- Details on how it was set up available at https://github.com/EESSI/eessi-demo/tree/master/CitC
- **If you're giving a talk on EESSI, we can set up a cluster like this for you for hands-on!**

[Kenneth]

Project proposals: NESSI & S4

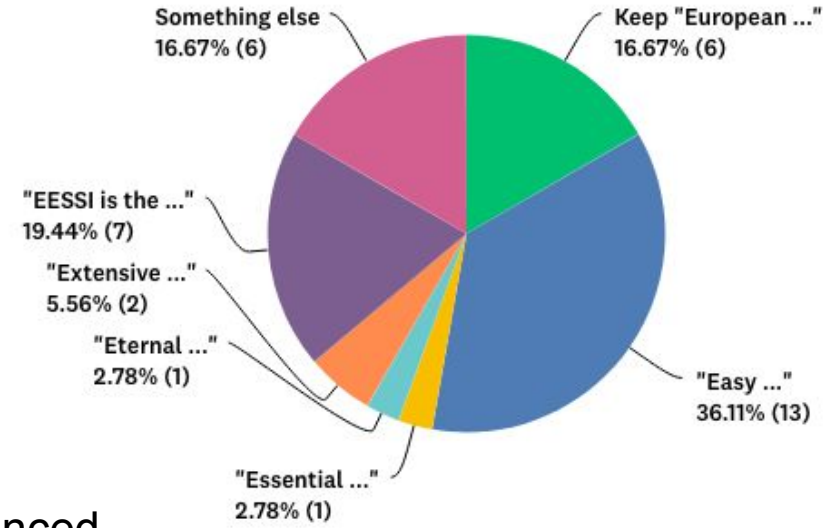
- NESSI is currently a pilot project in Norway: test EESSI pilot, contribute to EESSI where possible, running a Stratum 1 server in Norway
- Planning continuation towards using EESSI in production
  - initial scope: HPC machines and OpenStack / Kubernetes platforms
  - development phase of 12 months to help make EESSI ready for production
  - deployment phase of 6 months to deploy EESSI on national systems
  - operational phase
  - suggestion to increase effort to 2 FTE for the development
  - starting in March/April, keeping collaboration with EESSI ongoing
- Also, working on a proposal for the Nordic/Baltic region
  - Scientific Software Stacks as a Service (S4)
  - similar in goals to NESSI, but wider scope
  - if successful could start some time in 2022

[Thomas]

EESSI renaming poll (Dec'20)

Inconclusive poll

- Only 36% for "Easy …"
- 4 options with >15%
- 16% for keeping "European …"



Other suggestions:

- Extensible
- Elementary
- Extendable
- Enhanced ...
- Enabling ...
- "EESSI Environment …"

[Kenneth]

EESSI consortium: status

- Setting up an official EESSI consortium [Jaco]
  - Ongoing effort w.r.t. identifying interested parties
  - TODO: outline scope & responsibilities for consortium members
- EESSI renaming poll [Kenneth]
  - Poll end of last year was inconclusive (no clear majority)
  - Proposal: new, more organised attempt, in 3 rounds:
    - Round 0: collect *motivated* suggestions (by Feb 12th)
    - Round 1: first voting round to determine (3?) most popular suggestions (by Feb 19th)
    - Round 2: final voting round with only 3 choices, >50% majority needed (by Feb 26th)
    - Evaluate result during next EESSI meeting (Mar 4th)

[Jaco, Kenneth]

Next steps

- **Get more organised w.r.t. ongoing tasks and TODOs**
  - Set up project dashboards in GitHub EESSI organisation
  - Figure out who's interested in helping out, and with what
  - Label and prioritize issues and pull requests (focused effort)
- **Start leveraging available AWS cloud resources!**
  - Set up one or more additional Stratum 1 servers
  - Direct access to EESSI pilot repository via S3
  - Create (more) short-lived throwaway Slurm clusters to let interested people play with EESSI hands-on
  - **Automate procedure of building software and publishing it to Stratum 0**
  - Testing on Linux (+ macOS!) on various CPU architectures (Intel, AMD, Arm64)
  - Monitoring? Sources mirror?
- **Figure out "roadmap" towards production: minimal requirements, hurdles, etc.**
- Documentation (build nodes, native CernVM-FS access, …) + testing & CI (ReFrame)

Past events (all recorded!)

- EESSI behind-the-scenes presentation (Bob, Kenneth, Terje)
  - Jan 26th 2021
  - see https://github.com/EESSI/docs/tree/master/talks/20210119_EESSI_behind_the_scenes
- Bob's talk at 6th EasyBuild User Meeting
  - Jan 26th 2021
  - see https://github.com/EESSI/docs/tree/master/talks/20210126_6th_EUM
- Bob's talk at CernVM-FS workshop
  - Feb 2nd 2021
  - see https://github.com/EESSI/docs/tree/master/talks/20210202_CernVM_Workshop

Upcoming events

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

- EESSI presentations by Thomas for Nordic HPC sites
  - Sweden (Feb 5th)
  - Denmark (Feb 11th)
  - LUMI?