

EuroHPC JU Centre of Excellence

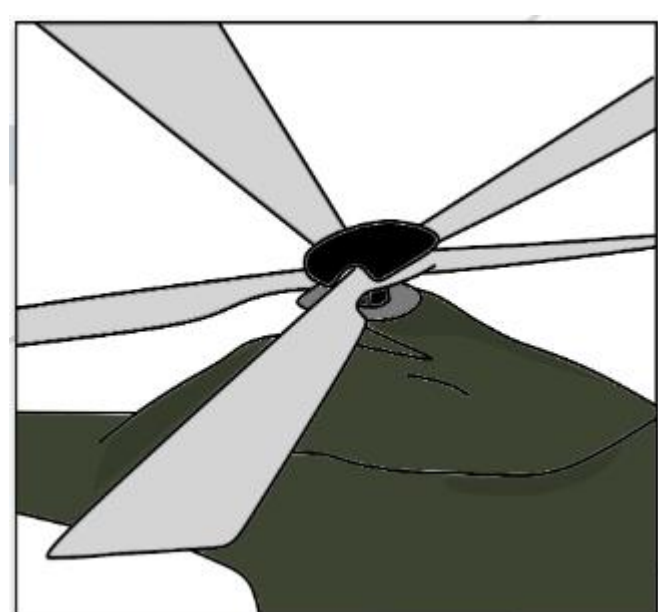
OBJECTIVES

- **Scientific**
 - Increase performance, productivity and portability (“the Three P’s”) across the entire spectrum of scientists active in the domain of multiscale simulation
 - Pilot multiscale use cases of societal and industrial significance:
 - Helicopter design and certification for civil transport,
 - Battery applications to support the sustainable energy transition,
 - Ultrasound for non-invasive diagnostics and biomedical applications.
- **Technical**
 - Focus on performance, automation, testing, collaboration
 - Application **and system** co-design for exascale technologies
 - Reduce technical burden on domain scientists
 - Provisioning of exascale-oriented libraries and services (such as CI/CD)
 - Scalable workflows and portable technologies

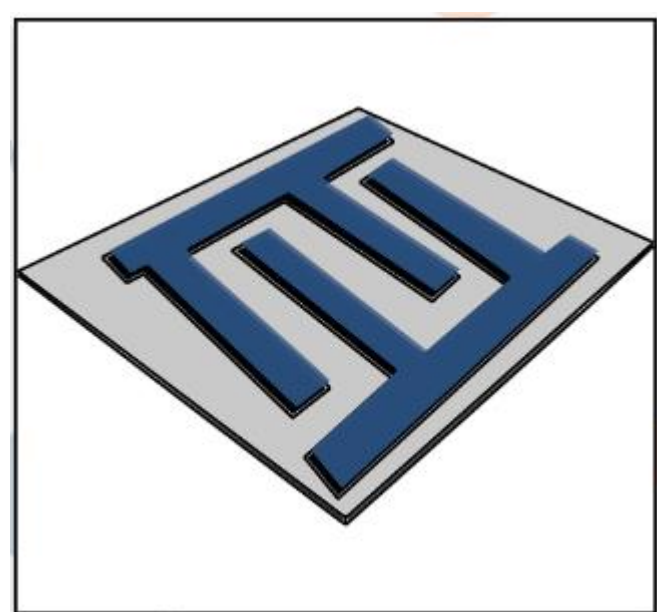
OUTCOMES

- Project workflows running at scale on EuroHPC systems
- Dramatic growth in the number of applications supported by the shared software stack (EESSI – European Environment for Scientific Software Installations)
- Accelerated adoption of EuroHPC compute services among the community
- Increasing HPC sites explicitly supporting the shared software stack EESSI
- Cloud providers promoting the EESSI stack in cloud environments
- Large number of developers using our CI tools
- Training Portal with our training courses and additional training content
- Adoption of MultiXscale software and workflows in the industrial community

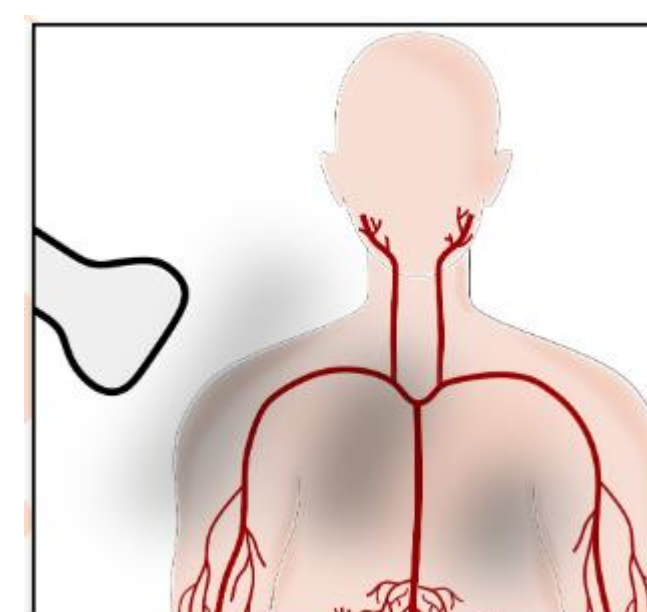
SCIENTIFIC SHOWCASES



Advanced parallel aerodynamic code for rotor aeroelastic analyses

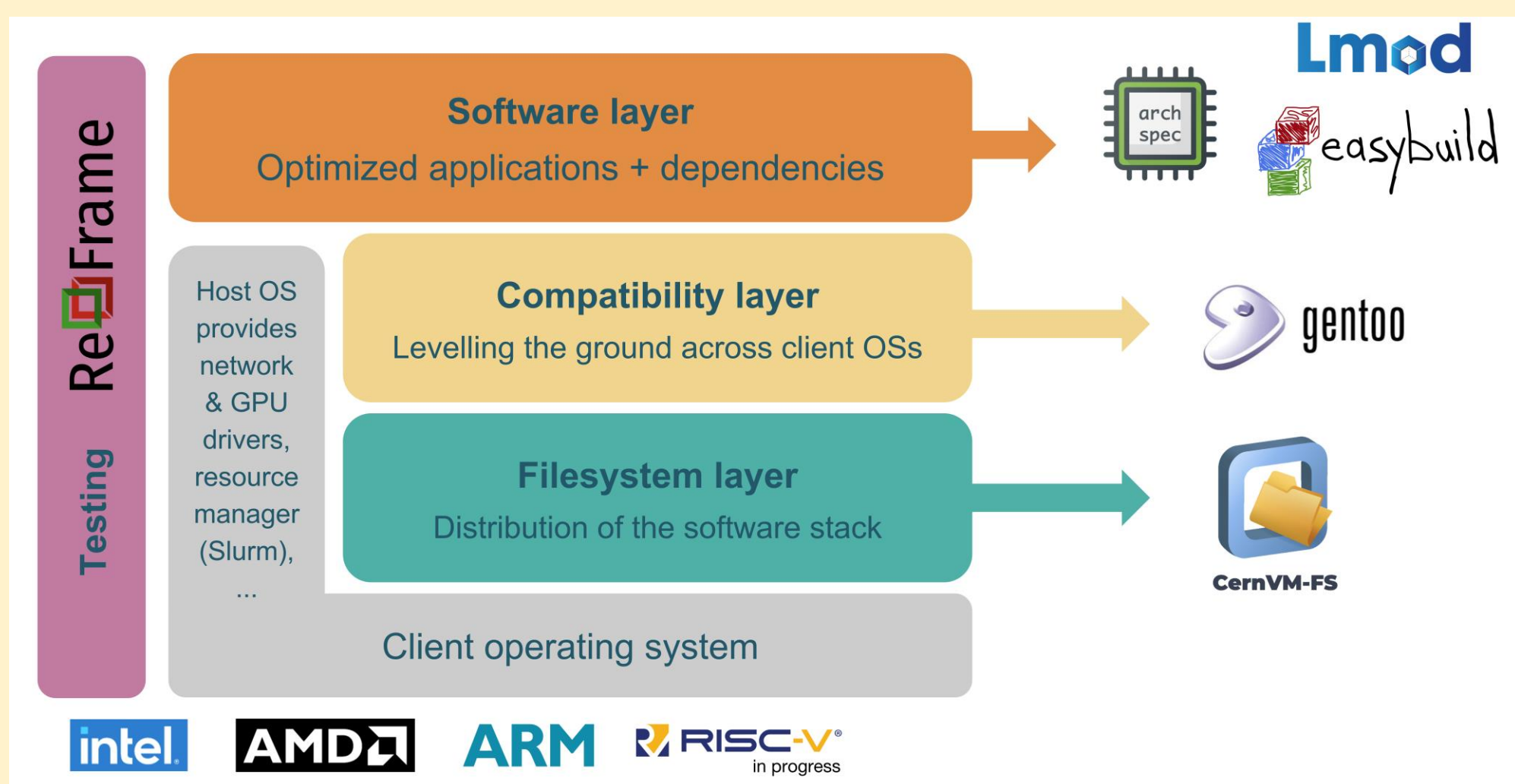


High-power battery Applications: Towards enhanced supercapacitor systems

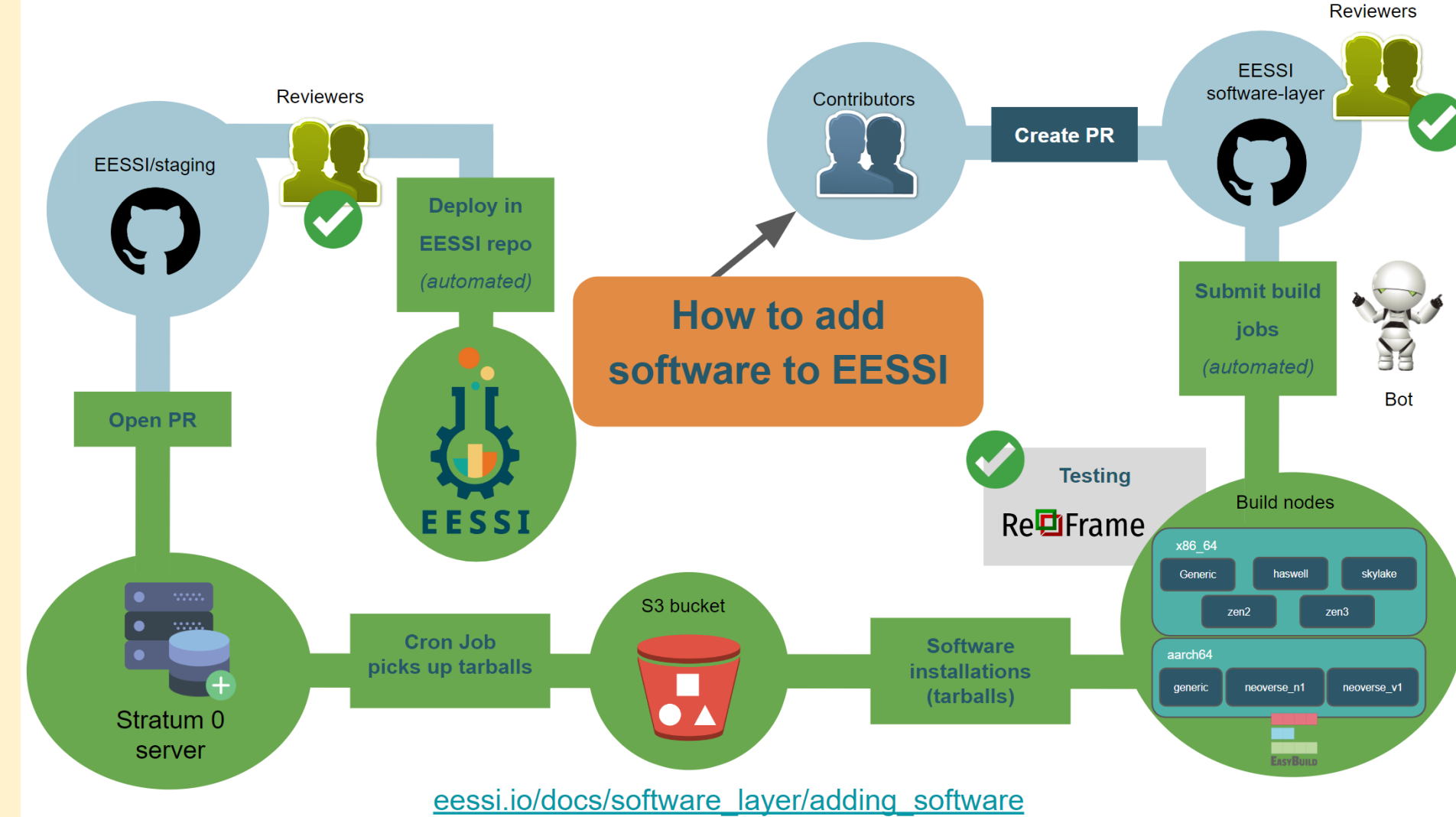


Biomedical applications of ultrasound: Improving diagnostics and guiding drug delivery

EESSI: Design



User software contribution workflow to EESSI



ACHIEVEMENTS

- EESSI: A streamed, production-quality, multi-platform, optimised scientific software stack
 - Production repository already available! (see <https://www.eessi.io/docs/repositories/software.eessi.io/>)
- Ansible playbooks, scripts, docs at <https://github.com/eessi>
- Available at Vega and Karolina EuroHPC centers
- CernVM-FS: Stratum 0 @ Univ. of Groningen + 3 Stratum 1 servers
- Software (CPU-only): Bioconductor, GROMACS, OpenFOAM, R, TensorFlow, ...
- Hardware targets:
 - {aarch64,ppc64le,x86_64}/generic
 - intel/{haswell,skylake_avx512}, amd/{zen2,zen3}, aarch64/{graviton2,graviton3}
- Supported by Azure and AWS: sponsored credits to develop necessary infrastructure

Try EESSI for yourself!



github.com/EESSI/eessi-demo

Partners: