MELUXINA EARLY ACCESS

CALL FOR PROPOSALS

APPLICATION DEADLINE: MARCH 19TH, 2021

LuxProvide S.A.
3 Op der Poukewiss, 7795 Bissen, Luxembourg

MeluXina: Call for Early Access

LuxProvide, the Luxembourg national HPC & HPDA center, is now accepting proposals for early access to the MeluXina supercomputer. Successful applicants will have a chance to run large-scale experiments and test their software on the system before the official start of operations.

Submissions for early access will be evaluated both on their ability to take advantage of a full MeluXina Module or a sizable proportion of multiple Modules, and on the potential impact on science, economy, and society.

Questions regarding early access may be sent to the mailing list: **meluxina-early-access@lxp.lu**.

Proposal submission

Proposals should come in the form of a 1 to 2 pages document, including:

- Short project title and abstract, contact details of the project owner and participants.
- A brief explanation of the application domain.
- A description of the planned experiment including references to own prior work in the domain.
- A description of the impact of the experiment.
- An estimate of the required node-hours.
- An argument explaining the advantages provided by using a state-of-the-art supercomputer.
- Technical capabilities of the software that will be used, including scalability figures (weak and strong) and data requirements in terms of transfers to/from the system and storage during the experiments.

Proposals must be submitted in electronic format PDF to the early access mailing list, with the message title: "Proposal: *Project Title*". The companion template in Annex 2 can be used as a guideline.

Application deadline: Friday, March 19th 2021, 23:59 CET

Resources

Access to the MeluXina supercomputer will be provided free of charge, without a guaranteed quality of service, for up to one (1) month between 01/05/2021 and 31/05/2021. These dates are provisional and depend on finalization of the system installation. The following resources will be provided and split among the projects:

- 82,000 node-hours on the Cluster module, split across ~4 projects.
- 28,000 node-hours on the Accelerator - GPU module, split across ~4 projects.
- 2,800 node-hours on the Accelerator - FPGA module, split across ~2 projects.
- 2,800 node-hours on the Large Memory Module, split across ~2 projects

MeluXina technical details are available in Annex 1.

At the end of the project, all resources, including storage must be freed by the project owner or project participants. Data will not be kept beyond the end of the project.

Results

The selected projects will be responsible for reporting the obtained performance and results. The report must be sent in electronic format (PDF) to the early access mailing list no later than two (2) weeks after the end of the project. The following will have the right to advertise project details and results on media of their choice: awardee, LuxProvide S.A. and its affiliates, the EuroHPC Joint Undertaking. Any advertisement should explicitly mention LuxProvide S.A. and EuroHPC Joint Undertaking. The exact acknowledgements text for the awardees to include in their publications will be provided in due time.

Acknowledgements & Disclaimer

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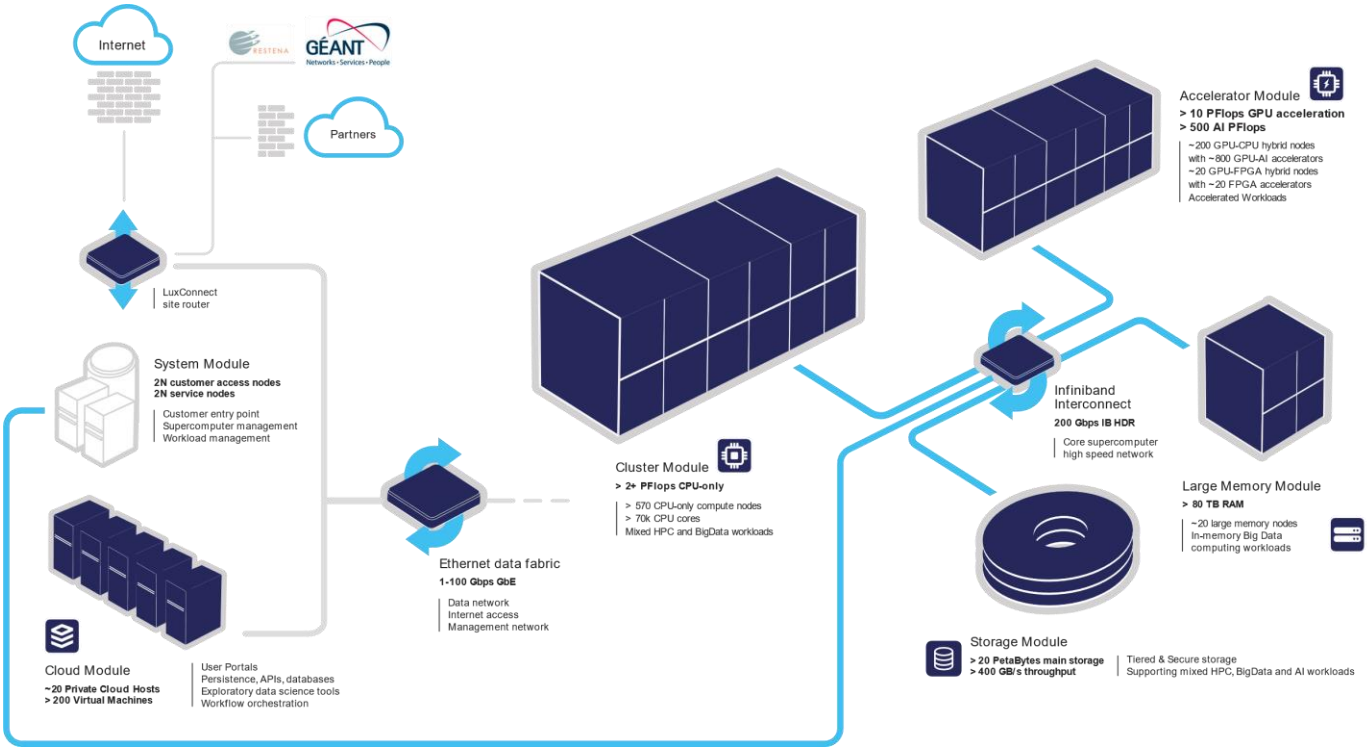
The publication only reflects the authors' view and the EuroHPC Joint Undertaking is not responsible for any use that may be made of the information it contains.

Annex 1: MeluXina Supercomputer - Technical details

System architecture



Hardware Specifications

Compute environment

- CPU nodes
    - CPU: 2x AMD Rome (2x 64-cores @ 2.6 GHz)
    - RAM: 512GB
    - Interconnect: 1x HDR (200GBps Infiniband)
    - Local storage: no local storage
- GPU nodes
    - CPU: 2x AMD Rome (2x 32-cores @ 2.35 GHz)
    - RAM: 512 GB RAM
    - Accelerator: 4x Nvidia A100 (40GB HBM, Nvlink)
    - Interconnect: 2x HDR (2x 200GBps Infiniband)
    - Local storage: 1.92TB SSD
- Large Memory nodes
    - CPU: 2x AMD Rome (2x 64-cores @ 2.6 GHz)
    - RAM: 4TB RAM
    - Interconnect: 1x HDR (200GBps Infiniband)

    - Local storage: 1.92TB SSD
- FPGA nodes
    - CPU: 2x AMD Rome (32-core, 2.35 GHz)
    - RAM: 512 GB RAM
    - Accelerator: 2x Intel Stratix 10MX (16GB HBM)
    - Interconnect: 1x HDR (200GBps Infiniband)
    - Local storage: 1.9TB SSD

Data environment

- Tier-0 storage:
    - Total size, performance: 0.6 PB, 400 GB/s
    - Filesystem: Lustre
    - Intended usage: 'scratch' directories; highly intensive, short term IO workloads
- Tier-1 storage:
    - Total size, performance: 12 PB, 190 GB/s
    - Filesystem: Lustre
    - Intended usage: user home and project directories; intensive, project-length IO workloads
- Tier-2 storage:
    - Total size, performance: 7.5 PB, 30 GB/s
    - Filesystem: Lustre
    - Intended usage: project backups for requesting projects
- Tier-3 storage:
    - Total size: 5 PB Tape Archive
    - Filesystem: LTFS
    - Intended usage: long-term storage of data for requesting projects

Software Specifications

Software environment

- Node OS: RHEL8/CentOS8 compatible
- Comprehensive software stack: based on EasyBuild, possibility to deploy also using Spack
- Compilers and SDKs: Intel, GCC, NVIDIA HPC SDK (including PGI compilers), Intel OpenCL SDK
- MPI suites: OpenMPI, IntelMPI, ParaStationMPI
- Programming languages: Python, R, Julia, Go
- Numerical, data and parallel/accelerator libraries: BLAS, LAPACK/ScaLAPACK, MKL, BLIS, FFTW, HDF5, netCDF, Eigen, ARPACK, CUDA, cuDNN, TensorRT, KOKKOS, NCCL, Intel TBB
- Performance tools: ARM Forge, Intel ITAC/VTune/Advisor/Inspector, GDB, Valgrind, NVIDIA NSight
- Frameworks: PyTorch, TensorFlow, Horovod, Keras, Spark
- Visualisation: VMD, ParaView, VisIT
- Container system: Singularity

Annex 2: Access proposal template

See the separate template document.