Objectif

ExaNoDe will investigate, develop integrate and validate the building blocks (technology readiness level 5) for a highly efficient, highly integrated, multi-way, high-performance, heterogeneous compute element aimed towards exascale computing. It will build on multiple European initiatives for scalable computing, utilizing low-power processors and advanced nanotechnologies. ExaNoDe will draw heavily on the Unimem memory and system design paradigm defined within the EUROSERVER FP7 project, providing low-latency, high-bandwidth and resilient memory access, scalable to Exabyte levels.

The ExaNoDe compute element aims towards exascale compute goals through:
• Integration of the most advanced low-power processors and accelerators (across scalar, SIMD, GPGPU and FPGA processing elements) supported by research and innovation in the deployment of associated nanotechnologies and in the mechanical requirements to enable the development of a high-density, high-performance integrated compute element with advanced thermal characteristics and connectivity to the next generation of system interconnect and storage;
• Undertaking essential research to ensure the ExaNoDe compute element provides necessary support of HPC applications including I/O and storage virtualization techniques, operating system and semantically aware runtime capabilities and PGAS, OpenMP and MPI paradigms;
• The development of a hardware emulation of interconnect to enable the evaluation of Unimem for the deployment of multiple compute elements and to leverage the potential of the ExaNoDe approach for HPC applications.

Each aspect of ExaNoDe is aligned with the goals of the ETP4HPC. The work will be steered by first-hand experience and analysis of high-performance applications and their requirements; investigations being carried out with “mini-application” abstractions and the tuning of their kernels.

Champ scientifique

Programme(s)

Thème(s)

Appel à propositions

H2020-FETHPC-2014

Régime de financement

Coordinateur
COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES

Adresse | Type d'activité | Contribution de l’UE
--- | --- | ---
Rue Leblanc 25 75015 Paris 15  France | Research Organisations | € 3 041 945

Participants (12)

ARM LIMITED

Adresse | Type d'activité
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110 Fulbourn Road CB1 9NJ Cambridge | Private for-profit entities (excluding Higher or Secondary Education Establishments)

EIDGENOESSISCHEN TECHNISCHE HOCHSCHULE ZUERICH

Adresse | Type d'activité
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Raemistrasse 101 8092 Zuerich | Higher or Secondary Education Establishments

IDRYMA TECHNOLOGIAS KAI EREVNAS

Adresse | Type d'activité
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N Plastira Str 100 70013 Irakleio | Research Organisations
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<td>FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.</td>
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CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS

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Type d’activité

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