



ChEESE

Work Package 3:
Co-design with European HPC
vendors and technologies

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19-20 January 2023

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WP3: Objectives

1	Extract to mini-apps the most relevant parts of applications according to targeted prototype architecture
2	Leverage European HPC technologies through the SE Community applications
3	Foster co-design with HPC vendors and technology and associated ecosystem (EuroHPC Pilots)



WP3: Tasks

Task	Task name	Start	End	Lead
Task 3.1	Preparation of mini-apps	6	18	CIN
Task 3.2	OpenSequana prototypes (EUPEX)	12	42	BA
Task 3.3	RISC-V prototypes, the European Processor Initiative (EPI) and EUPILLOT	19	42	BSC



WP3: Deliverables

D	Deliverable name	Lead	Type	Level	M	Date
3.1	Selected set of mini-apps and its requirements	CIN	R	PU	12	Dec 2023
3.2	SE Community applications on European HPC technologies	BA	R	PU	42	Jun 2026



T3.1 Preparation of the mini-apps

- Select and prepare the representative set of applications parts (aka mini-apps) as input for co-design of EUPEX and EUPILLOT prototypes (resp. T3.2 and T3.3).
- ChEESE-1P legacy mini-apps:
 - > mini-SeisSol, mini-SPECFEM3D, mini-FALL3D.
 - > Optimizations relevancy assessment with regards to the prototypes.
- ChEESE-2P new mini-apps:
 - > mini-xSHELLS, mini-HySEA, mini-Tandem and mini-pTatin3D.
- Identify for each mini-apps the needs regarding the software stack, including compiler toolchain, libraries, and its impact on the prototypes.
- The possibility to re-integrate the part mini-apps or kernel into its full application will also be studied in collaboration with WP2.

D3.1
(M12, CIN)

→ Strong collaboration with WP2 on the flagship codes audit, performance portability and optimization.

T3.2 OpenSequana prototypes (EUPLEX)

- Objective: preparing the SE Community applications for this platform from kernels and mini-apps to potentially full applications.
- What is EUPLEX?
 - > 4-year project (Jan. 2022 to Dec. 2025)
 - > Goal: Covering the full spectrum of required supercomputing technologies with EU solutions
 - > Objectives
 - Co-design a modular Exascale-pilot system.
 - Build and deploy a pilot hardware and software platform integrating EU technology.
 - Demonstrate the readiness and the scalability of the pilot technology in general and the MSA in particular, towards Exascale.
 - Prepare applications and European users to efficiently exploit the future Exascale machines.

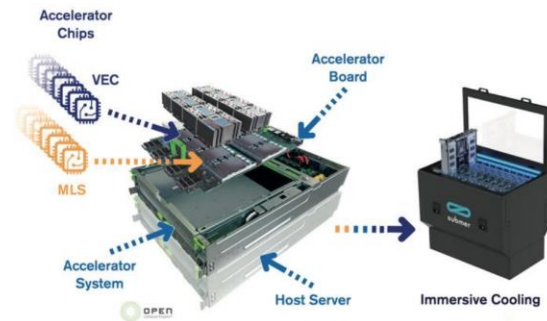


- Performance, scalability and potential energy consumption analysis on the EUPLEX platform.
- Foster collaborations between application developers, HPC scientists and technology providers.

T3.3 RISC-V prototypes, the European Processor Initiative (EPI) and EUPILLOT



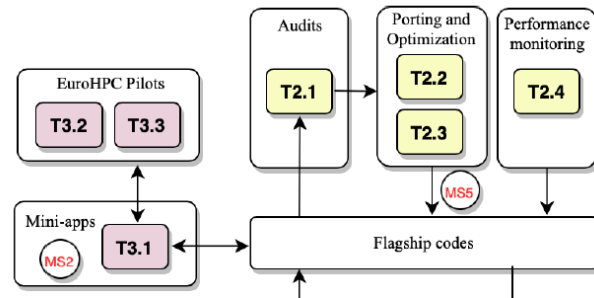
- Objective: studying CHEESE-2P mini-apps on SDVs or other RISC-V compute infrastructure.
- What is EUPILLOT?
 - > 4-year project (Jan. 2022 to Dec. 2025)
 - > Goal: European PILOT will deliver the first All-European open source and open standard based software and hardware integrated HPC system by creating an autonomous set of accelerators designed, implemented, manufactured, and deployed in Europe.
 - > Objectives
 - Extend open source to include opensource hardware for HPC.
 - Software/hardware co-design for improved application performance and system energy efficiency.
 - HPC and HPDA applications.
 - Stimulate European collaboration.
 - ...



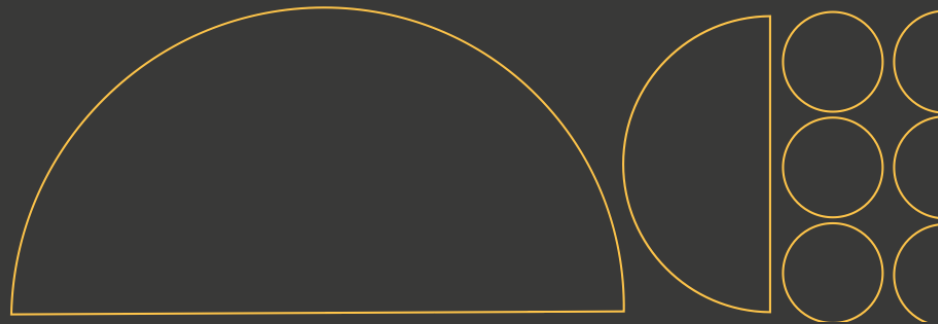
- Focus on the vectorization of the CHEESE-2P mini-apps and the measurements of their performance.
- Provide feedback not only to the application developers on how to efficiently exploit HPC EU platforms but also to the EPI/EuPilot architects for next generation EPI architectures and compilers.

Take away message

- WP3 is tightly connected to WP2 through Flagship codes
- Audits will be used as input for Porting and Optimization tasks and then will contribute the identification of mini-apps behavior
- The mini-apps will be used as SE representative codes for the EuroHPC Pilots
- The EuroHPC Pilots tasks will provide feedback to developers on how to take advantage of these current and future EU HPC systems: mini-apps adaptation
- Collaborations between application developers, HPC scientists and technology providers



Thank you!



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