



ChEESE

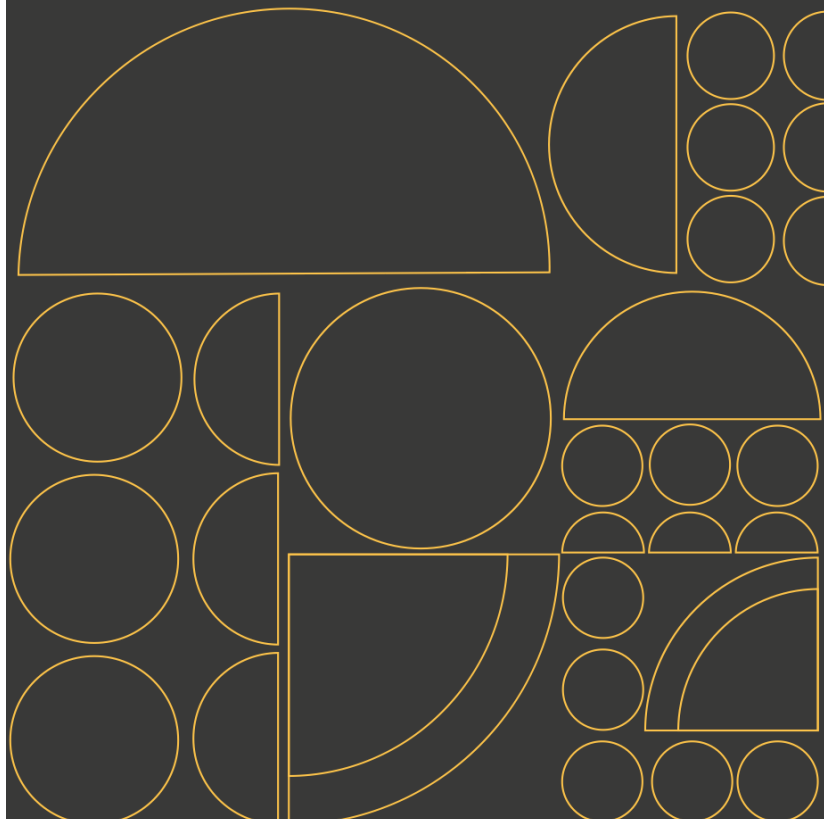
WP2 telco
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WP2: Tasks (current status)

Task	Name	Lead partner	Start month	End month
2.1	Code audits	HLRS	3(27)	15(30)
2.2	Increasing the performance portability of flagship codes for different accelerators	CIN	1	48
2.3	Optimisation for Exascale	CIN	6	48
2.4	Continuous Performance Efficiency Monitoring	BSC	18	48



WP2: Deliverables (current status)

D	Deliverable name	Short description	Lead	Type	Level	M
2.1	First code audit report	First code audit round results and the recommendations arising from the analysis	HLRS	R	PU	12
2.2	First report on improving code performance at exascale	Report on porting, optimization and tuning for the selected applications on the available hardware	CIN	R	PU	24
2.3	Second code audit report	Update of D2.1 and further recommendations arising from the analysis	HLRS	R	PU	30
2.4	Final report on improving code performance at exascale and Best Practice Guide	Technical report describing the achieved scalability level and related performances obtained for the selected applications on the available hardware including a final Best Practice guide	CIN	R	PU	48



Overall “WP2 vision”

code-centric activity + working methodology + dissemination of WP2 outcomes

- ❑ **Commitment:** reinforce a “Code-Centric” vision in ChEES-2P (flowing from WP2 to the other WPs)
- ❑ **Strong commitment:** consolidate the working methodology developed so far and advancing the performance and Exascale readiness of the eleven flagship codes (Exascale ambition).
- ❑ **Strong commitment:** internal and external dissemination of WP2 outcomes

Next steps (after 2nd review)

- ❑ **Finalization of planned improvements:** Complete the enhancements identified in Task T2.3 that are still pending.
- ❑ **Performance portability campaigns:** Support new campaigns in the presence of newly developed mini-apps or updated versions of existing mini-apps (Task T2.2).
- ❑ **TALP-based performance monitoring:** Continue the development and application of TALP, with special emphasis on monitoring accelerated codes and implementations targeting emerging hardware architectures (Task T2.4).
- ❑ **Lessons learned and methodology refinement:** Capture and document lessons learned, both on the general working methodology and on code-specific aspects, to guide future developments (towards D2.4).

WP2 and WP3



❑ WP2

- ❑ **full code, investigation (including porting, tuning) on CPU and GPU side. EuroHPC targeted. Code audit (but not only) driven.**
- ❑ + Performance (POP) metrics
- ❑ + Performance Portability study on GPU for mini-apps on EuroHPC (and SDV)

❑ WP3

- ❑ **mini-apps investigation/co-design (including porting, tuning) on CPU and GPU side. EUPEX/EUPILOT proxies.**
- ❑ + Performance/energy efficiency metrics



WP2			
Application	Target	Task	Methodology
Full code	EuroHPC CPU & GPU	Porting Optimization for exascale Continuous performance efficiency monitoring	Code audit driven (not only) Performance POP metrics
Mini-apps	EuroHPC GPU & SDV (GPU)	Porting Optimization	Performance portability



WP3			
Application	Target	Task	Methodology
Mini-apps	- OpenSequana prototype: EUPEX (ARM+HBM & GPU) - RISC-V prototypes: EPI & EUPILLOT	Porting Performance study Optimization (Scalability & Energy consumption analysis)	Co-design between SE community and Hw, Sw and Technology providers



WP2: publication “roadmap”



- ❑ **ChEESE recommend circulating all candidate publications among partners for approval at least 30 days before the publication date.**
- ❑ **At a minimum, please share the title, authors, and, if possible, the abstract.**
- ❑ We suggest using the cheese-science@geo3bcn.csic.es mailing list, which includes all researchers. Alternatively, you can share it through the mailing list of the relevant WPs.
- ❑ **It's strongly suggested to acknowledge project and (eventually) WPs participants in the publication...**

Open discussion: WP2 towards ChEESE3

- ❑ The idea is that WP2 should have a “vision” that is as shared as possible (with the necessary differences) to be conveyed to ChEESE3 (with the necessary differences).
- ❑ CINECA is very interested in conveying this “vision” (if we all agree).
- ❑ What can we convey?
 - ❑ **Flagship codes** that have intrinsic value in this context (obviously).
 - ❑ **The complete working methodology of WP2**, which is described in the next slide. This methodology is what truly involves all partners and will be one of the main outcomes of D2.4 (it must be clarified how, of course).
 - ❑ **Other** (what in particular?)



Towards a “WP2-as-a-Service”

In cooperation with: BSC, EVIDEN, HLRS

A Generalizable Methodology for Any HPC Code

WP2 developed a comprehensive methodology aimed at improving performance, portability, and sustainability of simulation codes, applied to ChEESE-2P flagship codes and mini-apps, but **designed to be generalizable and applicable to any codebase**.

This includes several key tasks and collaborative efforts with European performance and HPC centers.

WP2-as-a-Service

Objective:

To provide the WP2 methodology as a reusable, modular service for the broader HPC and scientific computing community.

Activities:

Formalization of the WP2 workflow into a structured service:

Code audit

Mini-app extraction & portability

Porting/tuning

Performance monitoring

Creation of reusable templates, documentation, and best practices.

Technical support for adoption and integration into external projects.

Training sessions and dissemination through workshops.

Interoperability with POP3, EuroHPC, and related services.

Transferability:

This “as-a-service” model allows **external research groups or developers** to benefit from WP2’s expertise without needing to reproduce the full infrastructure themselves.

Codes and TALP updates (template)

- **Updated results of new Performance portability campaigns**
(in the presence of newly developed mini-apps or updated versions of existing mini-apps)
- **Updated results of planned improvements** (in the presence of new enhancements identified in Task T2.3 that are still pending)
- **Updated TALP-based performance monitoring stuff**
 - Updated development of TALP
 - Updated application of TALP to selected codes/mini-apps



T2.2/T2.3/T2.4 updates from WP2 parters

