



D1.4 First update of the Collaboration plan Version 1.0

Document Information

Contract Number	101143931
Project Website	www.pop-coe.eu
Contractual Deadline	M18, June 2025
Dissemination Level	PU
Nature	R
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Keywords	Collaboration, dissemination, training, business development



This project has received funding from the European High-Performance Computing Joint Undertaking (JU) under grant agreement No 101143931. The JU receives support from the European Union's Horizon Europe research and innovation programme and Spain, Germany, France, Portugal, and the Czech Republic.
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Change Log

Version	Author	Description of Change
V0.1	Elena Markocic (BSC)	Initial Draft
V0.2	Marta Garcia (BSC), Bernd Mohr (FZJ), Brian Wylie (FZJ), Samir Ben Chaabane (TERATEC)	Contribution from WPs 2 and 3
V0.3	Elena Markocic (BSC)	Draft sent for internal review
V0.4	Stefan de Souza (HLRS)	Internal review of the deliverable
V0.5	Elena Markocic (BSC)	Consolidated document following the internal review
V1.0	Elena Markocic (BSC)	Version formatted for submission

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Executive Summary

This deliverable outlines the collaboration activities undertaken within the framework of POP3, as committed in Deliverable D1.3 (Collaboration Plan with the other Centres of Excellence) and CASTIEL 2 Deliverable 1.7 (Collaboration Plan with the CoEs). It also details the updates made to the internal collaboration plan.

1. Introduction

Given that collaboration with other Centres of Excellence (CoEs) in HPC is a core objective of the POP3 project, a comprehensive collaboration plan was developed during the project's first six months (Deliverable D1.3: Collaboration Plan with the other Centres of Excellence). This plan identified key areas for joint efforts, including assessment campaigns and services, dissemination, training, and business development. Additionally, the POP3 consortium has committed to strengthening these collaborations through active participation in CASTIEL2 initiatives.

This document presents the collaboration activities carried out during the first half of the POP3 project, emphasizing their anticipated impact. Furthermore, the preparation of this deliverable has provided an opportunity for the consortium to review and update the original collaboration plan.

2. POP3 Collaboration activities with the other CoEs

2.1 CoE Assessment campaigns and services

One of the core activities of POP3 are the services, both performance assessments and second level services. In POP3 we planned to dedicate a large percentage of the effort of the services to the other CoEs running in parallel with POP3.

2.1.1 Activities in the first half of the POP3 project

During the first half of the project, we have collaborated with the other CoEs in two main ways:

- Campaigns covering all the codes from the CoE
- Assessments of individual codes

We have done campaigns covering all the codes for ChEESE2 (two campaigns) and CEEC. Between these 3 campaigns we have done 27 assessments (16 still open at the moment of writing this document).

As for individual assessments for CoE codes we have 11 requests from EoCoE3, ESIWACE, EXCELLERAT, MultiXscale, Plasma-PEPSC, and SPACE.

From these assessments 4 second level services have been started. Two continuous advisories, one energy efficiency and one proof of concept. We have provided our services to 8 out of 12 current EuroHPC CoEs.

2.1.2 Expected impact

For POP3 it is very relevant to analyse CoE codes as they represent an important fraction of the codes running in our HPC clusters. From this analysis we gather insight on the main bottlenecks and identifiable patterns.

From this first set of assessments we detected a huge increase in the use of GPUs compared to previous POP editions. One of the main issues code developers have found is the lack of a common, hardware vendor agnostic programming model when porting their codes to GPUs.

The information provided by POP3 to CoE code owners during an assessment identifies issues hindering scalability and efficiency. This guides their development efforts to improve code performance within their CoE.

When proposing POP3, we had assumed that fewer proof of concept second-level services would be done than in previous POP editions, since if most customers of the project are from CoEs, they would have pursued their own efforts to implement the suggested improvements. However, the advisory study second-level service has proven highly valuable, as it accompanies developers in implementing optimizations and validating their expected impact.

2.1.3 Update of the collaboration plan

The collaboration plan with the Centers of Excellence (CoEs) continues as initially outlined. POP3 will maintain close and consistent communication with all CoEs to ensure alignment and support. As part of this ongoing engagement, POP3 will proactively inquire about each CoE's need for assessments related to both existing and newly generated codes, ensuring timely and relevant evaluation support as required.

2.2 Dissemination

2.2.1 Activities in the first half of the POP3 project

The POP3 dissemination team participated in the following CoE/CASTIEL2 dissemination and collaboration events:

- **Presentation** "ChEESE & POP3 CoE Collaboration" by Brian Wylie (JSC), EuroHPC Summit 2024, Elevate and Collaborate: European HPC NCCs and CoEs Workshop, Antwerp, 21 March 2024
- **Participation** by Bernd Mohr (JSC), Castiel2 NCC/CoE Communication Meeting, Brussels, 22 March 2024
- **Presentation** "Improving energy efficiency of parallel applications using MERIC", CASTIEL2 webinar, 14 June 2024
- **Participation** in walk-in networking session "HPC Applications Centres of Excellence" (together with EoCoE, ChEESE, MaX, ESiWACE, EXCELLERAT, MultiXscale), Amsterdam, 22 October 2024
- **Presentation** "Introduction to the POP3 CoE" by Bernd Mohr (JSC), Castiel2 NCC CoE online meeting, 8 November 2024
- **Presentation** "POP3: Lessons learned and challenges discovered from assessing European HPC codes" by Marta García (BSC), HiPEAC 2025, **Workshop** "From Petascale to Exascale and Beyond: the Centres of Excellence Challenge" (organized by ChEESE, EoCoE, ESiWACE3, EXCELLERAT, MaX, MultiXscale, POP3, SPACE), 20 January 2025
- **Presentation** "Experiences in Training and Collaborations Between CoEs" by Brian Wylie (JSC), HiPEAC 2025, **Workshop** "From Petascale to Exascale and Beyond: the Centres of Excellence Challenge" (organized by ChEESE, EoCoE, EXCELLERAT, ESiWACE3, MaX, MultiXscale, POP3, SPACE), 22 January 2025
- **Presentation** "Co-Design: From a Buzzword to Reality – An EPI Success Story" by Marta García (BSC), HiPEAC 2025, **Workshop** "Tackling software exascale challenges: the Centres of Excellence in High Performance Computing perspective" (organized by ChEESE, EoCoE, EXCELLERAT, ESiWACE3, MaX, MultiXscale, POP3, SPACE), 22 January 2025

We have also disseminated successful collaboration activities with CoEs or CASTIEL2 through our POP3 dissemination channels:

- Blog post and webinar "[30th POP Webinar - ChEESE and POP: a Story of Success and Fruitful Interaction](#)", 11 November 2024
- Blog post "[The POP-3 Project Supports CASTIEL-2 CI/CD Activities](#)", 23 December 2024

Finally, we have recently received access to the new Castiel2 NCC / CoE HPC portal hpc-portal.eu, where we created the POP3 profile (see <https://hpc-portal.eu/coes/coe-pop3>). In the future, we will use this site as an additional channel for POP3 event and training announcements.

2.2.2 Expected impact

In the first 18 months of the POP3 project, the consortium actively contributed to and benefited from close collaboration with CASTIEL2 as well as the coordinated collaboration actions with other CoEs (such as the co-organized workshops at HiPEAC 25 or the webinar about the successful measurement campaign with the ChEESE CoE). The engagement coordinated the European

HPC landscape and increased the visibility and impact of POP3 within the EuroHPC ecosystem.

2.2.3 Update of the collaboration plan

The POP3 dissemination team will continue to work closely with the dissemination team of other CoEs, once a POP assessment campaign (see above) is successfully finished. Another collaboration case is an especially successful POP performance assessment or 2nd-level service for a CoE application code (“success story”). In both cases, we plan to publish a POP blog article about the successful collaboration and/or a blog/news article on the corresponding CoE website or ideally both. In some cases (depending on the topic), the success story could be further disseminated via an episode of our POP webinar series.

In addition, the POP dissemination team continues to watch the social media and newsletter posts from the other CoEs, and by liking and re-tweeting their content, we help them increase their reach. We expect that the dissemination team of the other CoEs do the same.

2.3 Training

2.3.1 Activities in the first half of the POP3 project

There were two training sessions organised by the POP3 consortium in collaboration with CASTIEL2:

- 2024.09.04-06 CASTIEL2/EuroCC Training Sprint 2024 / VI-HPS-TW46 (IT4I, Czech Republic), recording available:
<https://www.youtube.com/watch?v=Jdjs6Lc7fX8>
- 2024.06.06 Presentation to CASTIEL2 WP3 on POP3 training

2.3.2 Expected impact

Over 60 participants from throughout Europe joined the Training Sprint hosted by IT4Innovations and co-organised with NCC Czechia, Poland, Slovakia, Hungary, Slovenia and Austria, learning about the POP methodology and tools, and associated services for application developers.

12 participants requested and obtained accounts on Karolina universal/CPU and accelerated/GPU partitions to apply POP tools to their application codes (or work through prepared examples that were demonstrated), acquiring practical experience in performance measurement and analysis, and receiving guidance in assessing optimization opportunities. Executions of application codes from ESiWACE, MaX and Plasma-PEPSC CoEs employing OpenACC and CUDA in combination with MPI were analysed, identifying and quantifying a variety of inefficiencies to be addressed by their developers. The follow-up

included POP services for execution performance and energy efficiency assessment of these CoE flagship codes.

2.3.3 Update of the collaboration plan

We plan to have at least four training events and more than 25 people trained in using our POP3 assessment tools and methodology each calendar year. Particular emphasis is on EuroHPC supercomputers and associated support staff and application developers, with events published on the HPC in Europe portal. A variety of training will be made available to all, mostly via the established Virtual Institute - High Productivity Supercomputing (VI-HPS). This will be complemented with bespoke training offered to EuroHPC hosting entities and related projects for application support and training such as EPICURE, EVITA and HPC SPECTRA. Hackathon-style workshops where participants (ideally in teams) apply our tools to assess their own application codes on EuroHPC computer systems (or similar systems) will be favoured. CASTIEL2 is also proposing an HPC curriculum including an HPC performance analysis module and discussing development of an advanced HPC profiling course which POP3 has offered to contribute to.

2.4 Business development

2.4.1 Activities in the first half of the POP3 project

The POP3 project aims to deliver a total of 120 services. These services are strategically divided to support different user groups:

- 80 services are dedicated to Centres of Excellence (CoE).
- 40 services are designed for non-CoE users, encompassing SMEs, academic institutions, and industry.

As most of the CoEs are already involved in the project, our business development strategy has focused on identifying potential users. We are actively seeking industrial partners, research institutes, and academic institutions in order to reach our target of 40 non-CoE users. We are collaborating with the CASTIEL project to attract additional CoEs that may not have been involved in our planned campaigns.

Prospecting for new users is an ongoing effort, and we initiated this process by reaching out to contacts from the previous POP1 and POP2 projects, leveraging our TERATEC network, using various mailing lists, and hosting webinars to attract potential users.

Up to May 2025, we invited 670 individuals to apply for POP3 services via email and sent two follow-up reminders to encourage engagement with potential users. To further promote the services, we organised two successful promotional webinars: one in September 2024 with NCCs in collaboration with the CASTIEL2 project, and another in May 2025, which was aimed at a targeted list of prospects.

We are actively generating demand for our services through announcements on websites and social media. To date, 17 services for non-CoE users, including one SME, have either commenced or been completed.

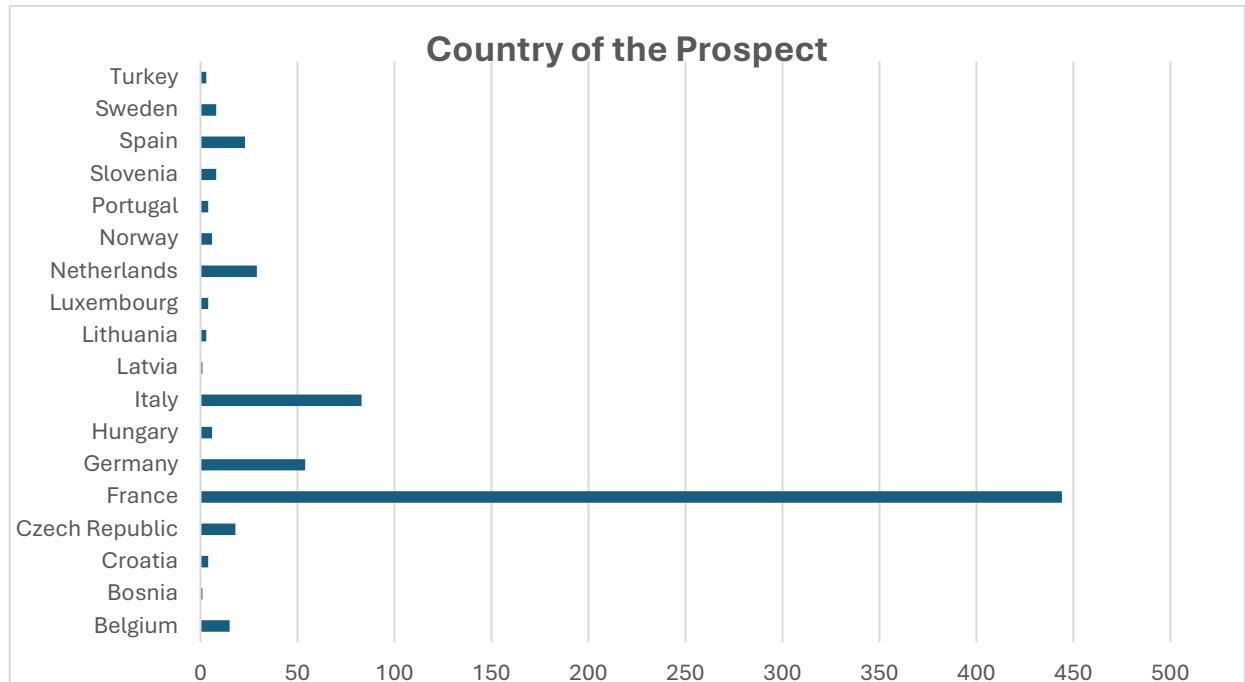


Figure 1: POP3 leads by country

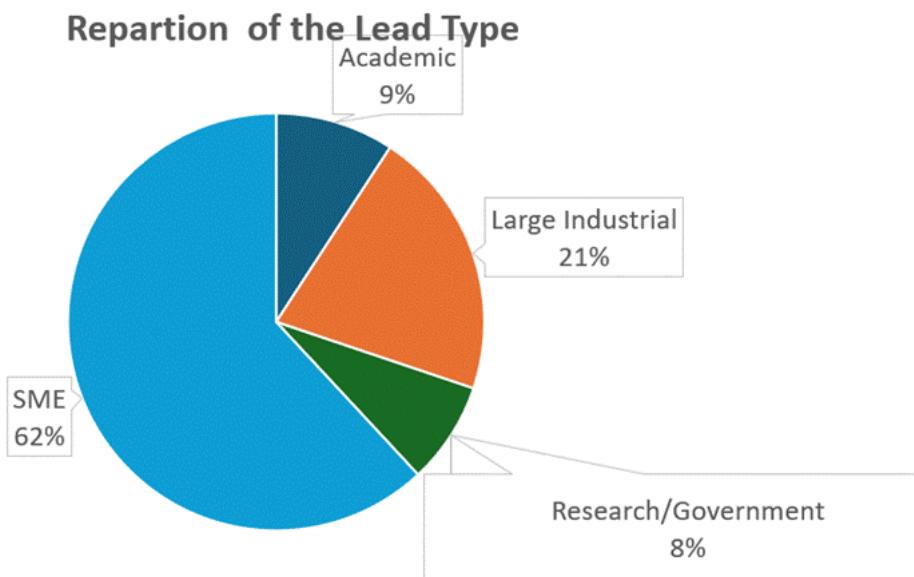


Figure 2: POP3 leads by type

2.4.2 Expected impact

The seventeen services launched or completed for non-CoE users, including one SME, are enhancing technical capabilities and accelerating innovation by providing access to specialist HPC/AI expertise for application optimisation and

performance improvement. Our ongoing engagement strategy, including follow-up reminders, is designed to further increase awareness and uptake of POP's offerings, driving broader adoption of advanced computing and boosting user competitiveness.

The success of this business development activity benefits POP3 CoE directly by validating the demand for their services. Every service they complete for a third party, particularly an SME, clearly demonstrates the expertise and the practical value of the POP framework. This strengthens POP3's reputation, expands their network and provides valuable case studies. Ultimately, this can attract further collaborations and secures future engagements, reinforcing POP3 central role in the HPC ecosystem and helping the COE to meet project targets.

2.4.3 Update of the collaboration plan

The strategy we use to generate demand on an ongoing basis involves exploring new contacts and expanding our mailing and promotional activities. We are working with CASTIEL 2 to hold a webinar once a month. The aim is to reach a wider audience across all European countries. We will actively seek support from Digital Innovation Hubs (DIHs), digital clusters and sectoral associations such as NAFEMS or Systematic. We are also focusing on attending relevant sectorial events.

3. POP3 Collaboration with CASTIEL2

3.1 Activities in the first half of the POP3 project

During the first half of the POP3 project, the consortium actively participated in CASTIEL2 initiatives by providing updates on POP3 KPIs, disseminating the CASTIEL2 weekly newsletter, joining the HPC in Europe Portal, and attending various meetings and events organized by CASTIEL2.

3.2 Expected impact

In the first half of the POP3 project, the consortium actively contributed to and benefited from close collaboration with CASTIEL2. This engagement supported coordination across the European HPC landscape and enhanced the visibility and impact of POP3 within the broader EuroHPC ecosystem.

POP3 KPIs – Supporting Strategic Oversight

POP3 regularly provided CASTIEL2 with updates on project Key Performance Indicators (KPIs), offering a clear overview of progress and achievements. These inputs supported CASTIEL2 in assessing developments across all EuroHPC Centres of Excellence (CoEs), enabling more informed decision-making and highlighting POP3's contributions to the evolving European HPC landscape.

CASTIEL2 Weekly Newsletter – Enhancing Communication and Visibility

POP3 disseminated the CASTIEL2 weekly newsletter to all consortium members, ensuring timely communication of events, training opportunities, and updates relevant to National Competence Centres (NCCs) and CoEs. This channel enhanced awareness of broader EuroHPC activities, including those organized by parties outside the CoE and NCC community, and contributed to the visibility of both CASTIEL2 and POP3 initiatives.

In return, the newsletter increased exposure of POP3's own services, events, and outcomes to a Europe-wide audience, expanding outreach beyond its immediate network.

HPC in Europe Portal – Promoting Access and Engagement

POP3 joined the HPC in Europe Portal alongside other CoEs and NCCs, sharing up-to-date information about its services, events, and project activities. This inclusion improved accessibility for interested third parties and fellow CoEs/NCCs, fostering broader engagement with POP3 offerings and increasing opportunities for collaboration.

Participation in CASTIEL2 Meetings – Strengthening Collaboration

POP3 actively engaged in CASTIEL2's collaboration framework, regularly attending its working group meetings. The project contributed to thematic discussions in areas such as:

- Training, Twinning, and Mentoring
- Continuous Integration and Continuous Deployment (CI/CD)

Additionally, POP3 participated in the CASTIEL2 All-Hands Meeting held in Slovakia in April 2024. This event provided a valuable platform for initiating dialogue with other CoEs and NCCs, sharing information about POP3's services, and exploring future synergies. POP3 plans to attend the upcoming All-Hands Meeting scheduled for autumn 2025, further solidifying inter-project collaboration.

3.3 Update of the collaboration plan

The collaboration between POP3 and CASTIEL2 during the first half of the project has been mutually beneficial. It has facilitated information exchange, enhanced visibility, and laid the groundwork for more integrated support structures and shared initiatives across the EuroHPC community.

The collaboration plan between POP3 and CASTIEL2 will remain unchanged for the second half of the project, continuing the established activities such as information exchange, dissemination, and participation in joint events. In addition, POP3 will begin formulating and sharing success stories that highlight the project's impact, following the guidelines provided by CASTIEL2.

4. Conclusion

The collaboration activities with CASTIEL2, EuroHPC CoEs, and other HPC stakeholders are progressing in line with the initial plan. These activities continue to comprise both technical and non-technical dimensions, ensuring a comprehensive approach to engagement. On the technical side, the focus remains on delivering targeted assessments and services that address the evolving needs of the CoEs and stakeholders. In parallel, collaboration extends to areas such as dissemination, training, and outreach to industry and businesses, promoting the broader impact and uptake of POP3 services.

While the core elements of the collaboration plan remain unchanged, adjustments and updates may be introduced as necessary to reflect emerging priorities or new opportunities. Any such modifications will be documented and integrated into the final version of the collaboration plan, which will be submitted at the end of the project. This ensures the plan remains responsive, effective, and aligned with the objectives of all involved parties.

5 Acronyms and Abbreviations

POP3 Beneficiaries

- BSC: BARCELONA SUPERCOMPUTING CENTER - CENTRO NACIONAL DE SUPERCOMPUTACION
- FZJ: FORSCHUNGSZENTRUM JÜLICH GMBH
- RWTH: RHEINISCH-WESTFALEISCHE TECHNISCHE HOCHSCHULE AACHEN
- IT4I@VSB: TECHNICAL UNIVERSITY OF OSTRAVA
- INESC ID: INSTITUTO DE ENGENHARIA DE SISTEMAS E COMPUTADORES, INVESTIGAÇÃO E DESENVOLVIMENTO EM LISBOA
- TERATEC: TERATEC
- UVSQ: UNIVERSITE DE VERSAILLES SAINT-QUENTIN-EN-YVELINES
- USTUTT: UNIVERSITY OF STUTTGART FOR ITS HIGH PERFORMANCE COMPUTING CENTER STUTTGART