D2.3 First Dissemination and Business Report
Version 1.0

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Change Log

Version	Author	Description of Change
V0.1	Katherine Cordery	Initial Draft
V0.2	Bernd Mohr	Incorporating Training (Brian) and Business (Samir) inputs
V0.3	Ricardo Nobre	Internal Review
V1.0	Bernd Mohr	Final Draft
		(Final Change Log entries reserved for releases to the EC)

Table of Contents

Executive Summary

This report summarises the dissemination and training activities as well as events for the first 12 months of the third phase of the POP CoE (POP3), from January 2024 to December 2024.

The successful branding and dissemination efforts from previous iterations of the CoE were continued during this phase of POP3. The dissemination team promoted project objectives, activities, and results via established dissemination channels, e.g., 25 blog articles, 4 newsletters, 6 webinars, and numerous social media posts. Members of the consortium participated in key conferences and events, presenting talks and posters. Compared to the end of the second phase of POP, followers of our various social media accounts (X, Linkedin) and subscribers to our Newsletter are still (slightly) increasing, and offline views of our webinar presentations almost doubled.

POP training efforts were continued: in the reporting period, we organised 1 training event, co-organised another 4 in cooperation with VI-HPS and CASTIEL2, and contributed to 5 training events organised by other organisations. As a result, 86 participants of hands-on trainings learned the POP methodology to apply our tools to their application codes; and many more (100+) followed presentations or accessed recordings of the training.

As two thirds of the planned POP services are targeting CoE applications, our business development strategy focused on the identification of potential users in industry, including at least 12 SMEs. Also, we are working with the CASTIEL2 project to attract additional CoEs who may not have been involved in our planned campaigns. Exploitation continues as planned.

1. Introduction

This report highlights the dissemination, business development and training activities performed for WP2 of the POP CoE during the first reporting period (January 2024 to December 2024). The aim of this deliverable is to demonstrate the efforts that have been completed in order to meet the objectives defined in the dissemination plan (D2.2) in order to increase the visibility of the project and attract new users.

In the following sections, we describe the dissemination and training activities as well as business development and exploitation efforts in detail.

2. Dissemination Report

The POP3 project continued the successful branding established during POP1 and POP2. POP3 extends and maintains dissemination material and tools including logo and other branding material, the corporate design and the public website.

The dissemination activities were defined in the dissemination and business plan (D2.2).

2.1 General Objectives

The following objectives were defined for task T2.1 (dissemination) in the dissemination and business plan (D2.2):

- Provide tools for dissemination and support task T2.3 (business development) in their marketing and community development as well as task T2.2 (training).
- Disseminate the project objectives, activities, and results via the public website, press and social media;
- Participate in key conferences and events to publish project results and disseminate the offered services;
- Identify and perform training activities in order to engage interested parties in the usage of the offered services, both at POP member sites and directly at customer sites.

Key dissemination messages in all communication activities were refined using customer advocacy data from task T2.3. They are summarized in Table 1.

Target Audience	Dissemination Message	Dissemination Channels
Industrial HPC Users and Code Developers	• ROI through improved code and amount of savings • Increased competitiveness and market share • Faster time-to-solution	Website (blog), social media, online press, newsletter, events, webinars
Academic HPC Users and Code Developers	• Better code performance or scalability • Ability to better explore parameter space and increase complexity	Website (blog), social media, trainings, webinars
HPC Code Developers	• Importance of performance aware design	Website (blog), social media, webinars, newsletter, publication
HPC Infrastructure and Service Centres	• ROI through improved code performance	Website (blog), social media, online press, newsletter, events, webinars
Standardization Bodies	• Improved code performance	Website (blog), social media, online press, newsletter, events

Table 1: Key Dissemination Messages

2.2 Website

We continued to use and maintain the main project website (https://pop-coe.eu) for overall presentation and dissemination of the project. The website informs interested individuals of the latest news regarding the progress and outcomes of the project. The website also includes the POP blog (see below) as well as the online archive for project and training material.

Figure 1. POP CoE landing page

The basic page layout, which was established in the previous funding phases of the POP CoE, was maintained and consists of a fixed header and footer and the always-visible menu bar on the left side, which provides quick-access to all parts of the website. It provides the same basic look-and-feel for all pages of the website. The main landing page (shown in Figure 1) displays the overall mission, an introductory video about POP, highlighted blog article(s), a "latest-news" sticker (in green, top right) and links to the social media channels.

The design favours information and function over appearance, i.e., it focuses on quick and easy access to information rather than focusing on looking "nice", avoiding the use of large pictures and video content. This is considered important by the project members because we are a **technical** CoE with a focus on **performance**. Another important aspect of the design was to make it easily accessible for different devices (e.g. desktop computer, laptop, tablet, or smartphone).

The website is based on the Drupal Content Management System. The project coordinator (BSC) is hosting the system and the dissemination team located at Jülich Supercomputing Centre is managing it. A RSS feed system is set up to inform individuals about the latest updates of web pages.

2.2.1 Blog

Integrated into the POP website is another important pillar of the POP dissemination, the POP blog. It features articles about major project results and outcomes, reports from training and dissemination events and other news items, which may interest the HPC community. While the dissemination team writes most of the blog entries (based on the input provided by other project members), it also allows to publish news items and stories related to POP or about POP written by project externals, as blog entries can have a specified (visible) author. Blog articles are typically written in a more personal, sometimes even opinionated, style that is hopefully more attractive to the targeted audience than formal newsletters and press releases.

The blog also serves as an easily accessible news archive for the project. It allows people to look up specific subsets of articles based on tags via a special URL, e.g., https://pop-coe.eu/blog/tags/events or via a tag cloud (see Figure 2, top right) or to easily browse them by (publication) time.

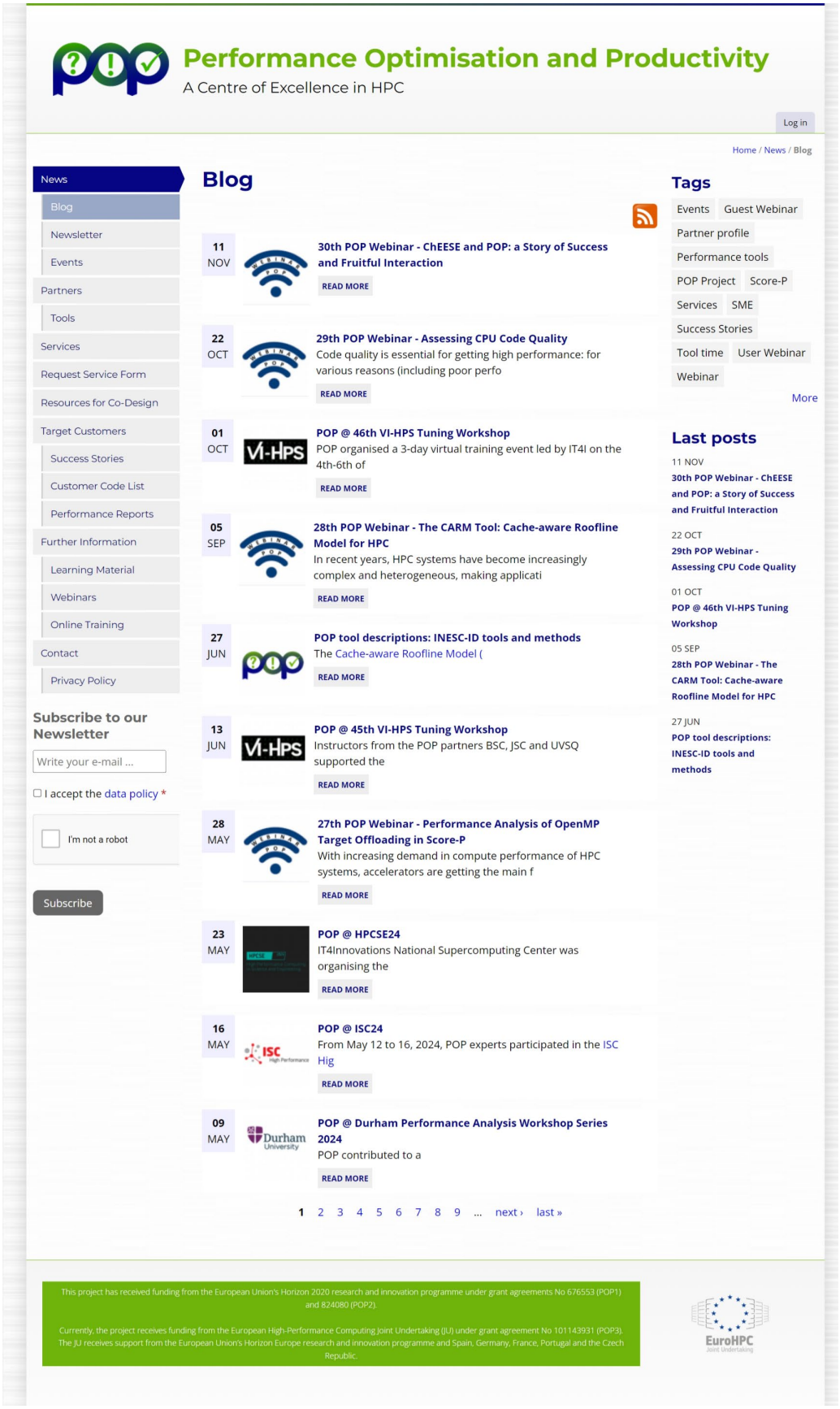

Figure 2. POP Blog with tag cloud at the top right

The following articles were published in the reporting period:

Events (11)

- POP @ 43rd VI-HPS Tuning Workshop
- POP @ 44th VI-HPS Tuning Workshop
- POP @ EuroHPCSummit 2024
- POP @ Durham Performance Analysis Workshop Series 2024
- POP @ ISC24
- POP @ HPCSE24
- POP @ 45th VI-HPS Tuning Workshop
- Tools Research Beyond POP
- POP @ 46th VI-HPS Tuning Workshop
- POP @ EuroHPC User Day 2024
- POP @ SC24

Webinars (6)

- 26th POP Webinar - Asynchronous GPU Programming in OpenMP
- 27th POP Webinar - Performance Analysis of OpenMP Target Offloading in Score-P
- 28th POP Webinar - The CARM Tool: Cache-aware Roofline Model for HPC
- 29th POP Webinar - Assessing CPU Code Quality
- 30th POP Webinar - ChEESE and POP: a Story of Success and Fruitful Interaction
- 31st POP Webinar - OpenMP 6.0 Part 1: New Host-side Features and Enhancements

Project News (8)

- We are back for a Third Round!
- POP3 Kickoff Meeting
- POP partner profile: The HPCAS group of INESC-ID R&D Institute
- POP tool descriptions: RWTH performance and correctness tools
- POP tool descriptions: INESC-ID tools and methods
- POP3 1st Plenary Meeting
- POP3 2nd Plenary Meeting
- The POP-3 Project Supports CASTIEL-2 CI/CD Activities

This means that in the first twelve months of the project 25 blog articles were published slightly over-fulfilling the KPI target of 24.

2.3 Social Media

Both the X and LinkedIn channels were maintained and new templates were designed for webinar, newsletter and workshop posts. The templates (see Figure 3 to Figure 7) have been designed to create a modern, professional and cohesive look for social media posts while maintaining the POP colour scheme. The POP logo is prominently displayed at the top right-hand corner with an added “webinar”, “newsletter” or “workshop” underneath it and the website link

in the bottom right-hand corner. The shape of the area for the speaker/presenter names is reminiscent of the rounded shape of the letters in the logo and the colour was selected to match the POP colours. The templates allow a fast and easy creation of a visual post.

Webinar post templates have been prepared for up to three speakers. The male and female avatars are to be used where a professional, high quality image of a speaker could not be obtained. The logo of the speakers' institution is displayed and the information for the webinar is filled in. Wherever possible speakers are tagged in the posts in order to increase the reach and hashtags are added. To improve accessibility a details alt text including all relevant details is added to the image prior to posting.

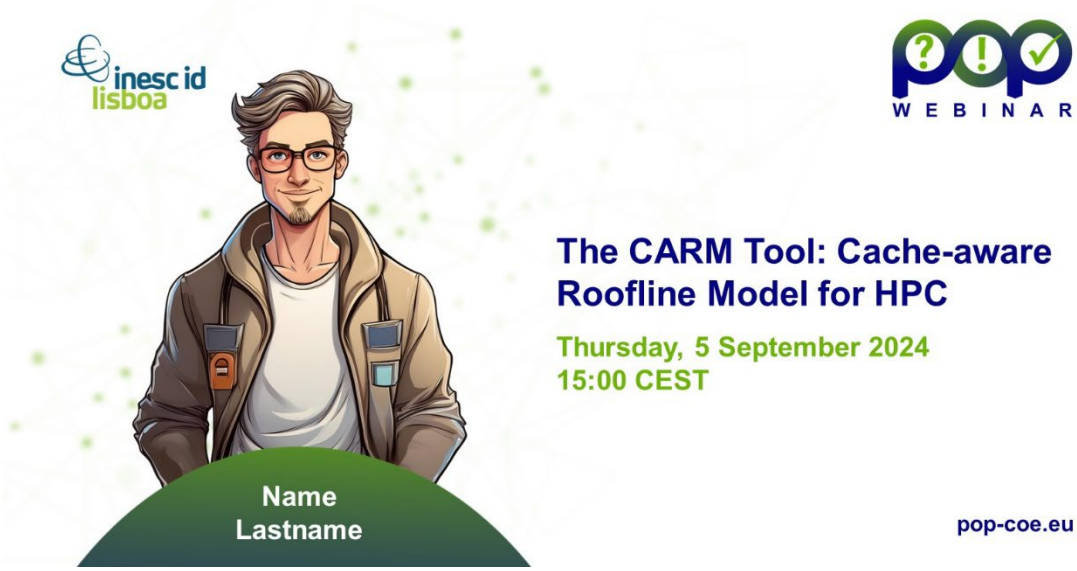

Figure 3. Webinar template for one speaker

Figure 4. Webinar template for two speakers

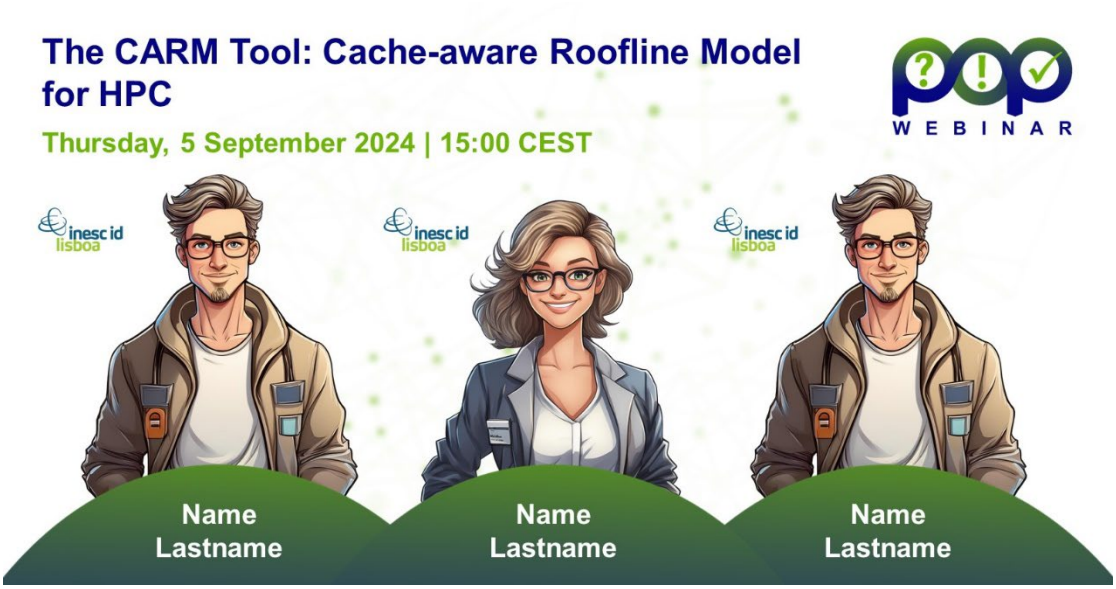

Figure 5. Webinar template for three speakers

Figure 6. Example for a Webinar post on LinkedIn

Figure 7. Example Webinar post on X

The newsletter template (see Figure 8) was created with an image to grab the attention of potential readers while quickly scrolling through a newsfeed; however, the design was intentionally simple. For each new edition of the newsletter, the number at the bottom right is updated for minimal editing effort and to maximise the recognition value.

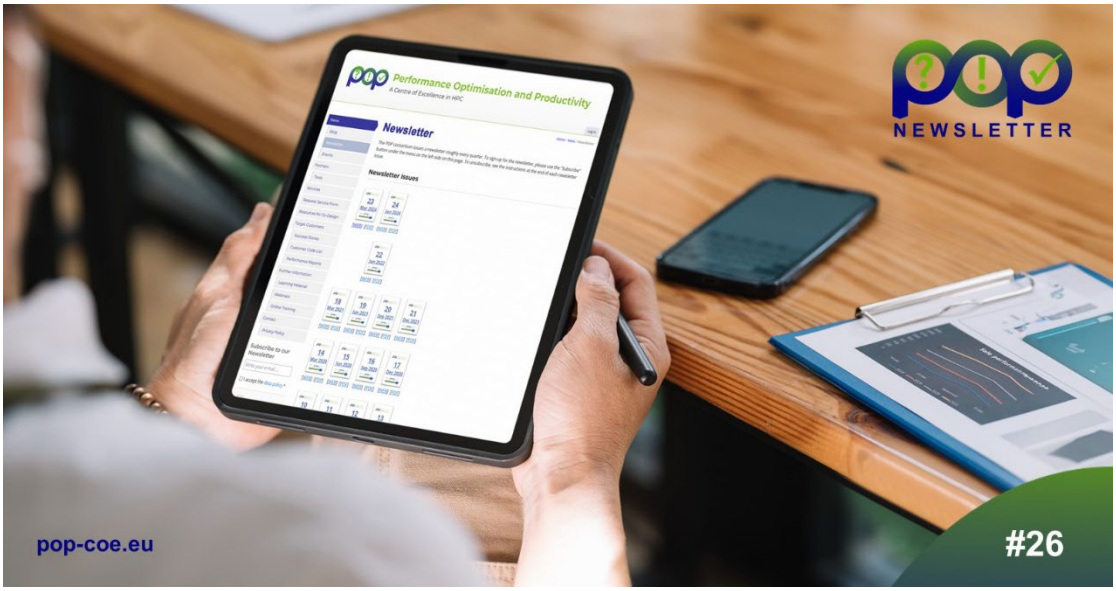

Figure 8. Template for a Newsletter post

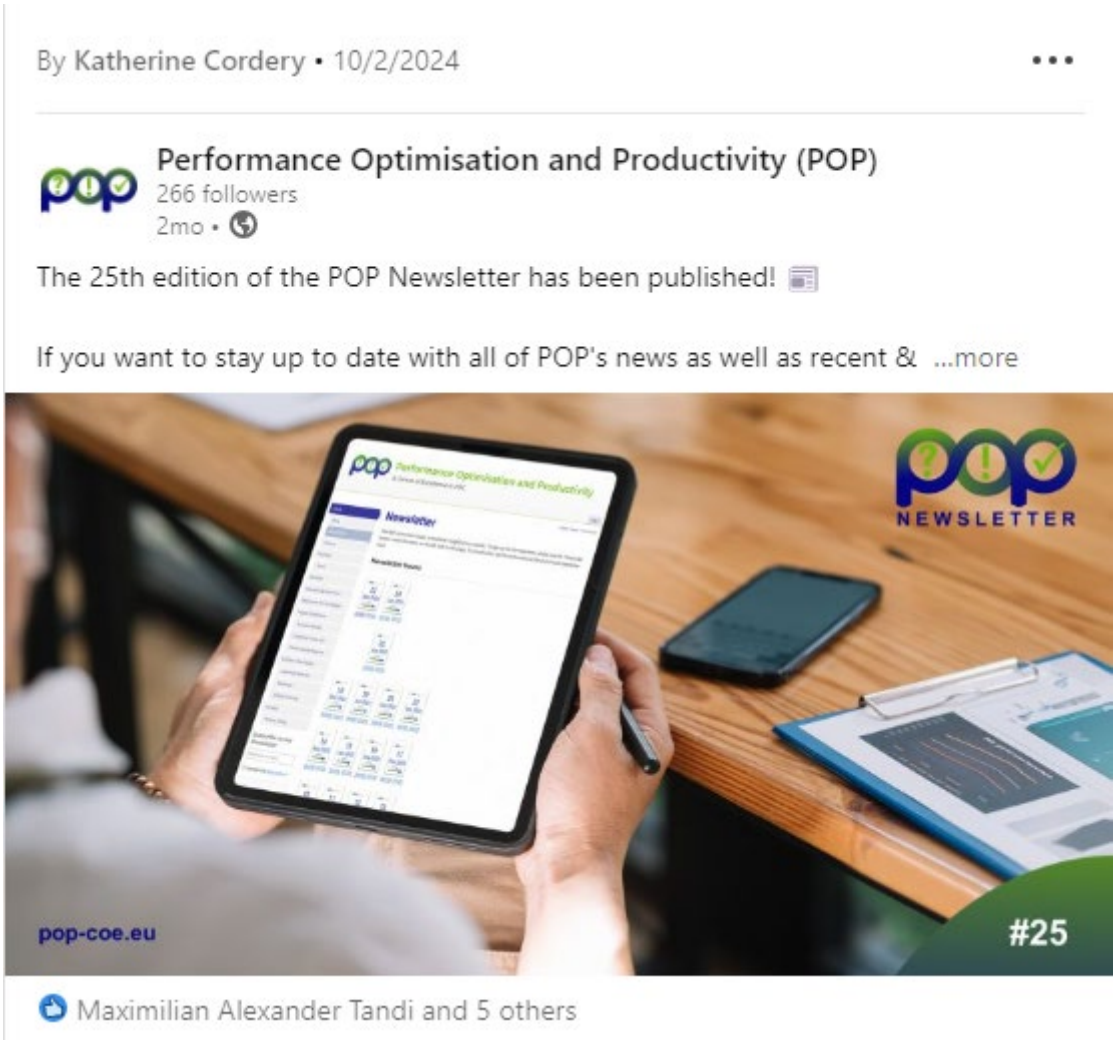

Figure 9. Example for a newsletter post on LinkedIn

The look of the template for workshops (see Figure 10) is very similar to the webinars, however in addition to the POP logo there is a space for an event logo in the top right corner.

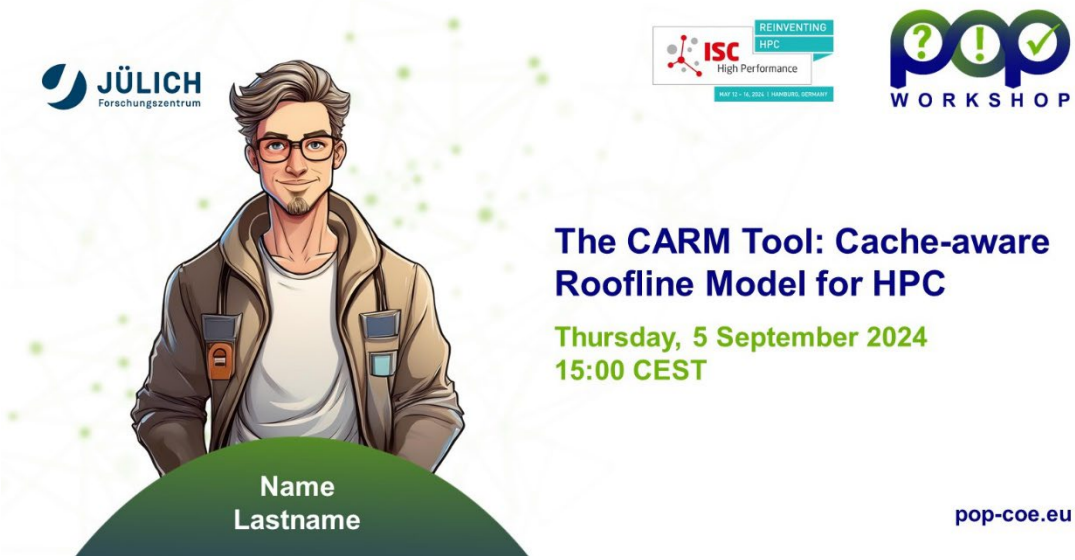

Figure 10. Template for a workshop post

2.3.1 LinkedIn

As our primary media channel, we use LinkedIn as it is clearly a professional social media channel compared to Facebook, which typically has a more private and personal news content. Like on X (see below), we announce and post links to our webinars, newsletters and training events.

In the first reporting period for POP3, the number of followers of our page (https://www.linkedin.com/company/performance-optimisation-and-productivity-pop/) has grown from 201 to 274. 9,070 impressions and 251 reactions were recorded.

2.3.2 X

The POP X channel (https://x.com/POP_HPC) has seen a slight decrease in followers from 1122 followers in Jan 2024 to 1114 followers in December 2024. Although there is a general trend of moving away from the platform, our project still has a large following, and the impressions (around 780 for webinar posts) are still good. However, we will closely observe the trend in the upcoming months.

2.3.3 Bluesky

Bluesky is being discussed within CASTIEL2 and many other EuroHPC projects as a potential additional platform in light of the trend away from X. It is currently the platform most similar to the original X/Twitter, and it get more attention than other alternatives like Threads or Mastadon.

2.3.4 YouTube

All video content produced by POP is made accessible through the POP HPC YouTube channel (https://www.youtube.com/POPHPC). It contains recordings of the POP webinars, the POPCasts, and the POP Online training modules, as well as introduction and overview videos about the POP CoE.

The list of the 6 POP webinars, which were organized in the first year of the project, can be found in section 2.2.1 of this document under the category "Webinars". 197 people registered for the webinars, and 119 participated. An average of 11% of these persons were non-male, varying from 6 to 23% over the various webinars.

The POP Youtube channel has continued to grow – from 387 subscribers in May 2024 to 437 subscribers in December 2024 – and all webinars continue to be posted on the site.

Currently the channel provides 31 webinars (6 from POP1, 19 from POP2, 6 so far from POP3), 4 POPCast (all POP2), and 11 Online training modules (all POP2). The webinars currently have 47,661 offline views, compared to 24,352 at the time of the POP2 final review. The Online training modules videos have 5,643 offline views, compared to 2,931 at the time of the POP2 final review.

2.4 Other media

Beyond the POP main project website and the POP social media channels, we use email newsletters, scientific papers, and attending and presenting at events as additional dissemination channels. In addition, we try to position articles and other contributions on other HPC focused websites and in HPC media and related project newsletters as discussed below.

2.4.1 Newsletter

We also continued the quarterly POP Newsletter started in POP1, which features summaries of the main project activities and results from the past three months as well as announcements of upcoming events and project activities. The newsletter is distributed by HTML email but it is also archived on the project website (https://pop-coe.eu/news/newsletter) in HTML and PDF format.

In the first year of the third phase of the POP project, we published four new newsletters (March 2024 to December 2024). The newsletter subscriber list currently has 1,597 members, compared to 1,525 at the time of the POP2 final review.

2.4.2 Scientific papers

Although POP is a service-oriented EU Centre of Excellence and not a research and innovation action, we still try to publish important results, procedures, methodologies, or insights in peer-reviewed scientific/technical papers. In the reporting period, no papers have been published yet.

2.4.3 Other websites and newsletters

Besides publishing on the POP website, blog and social media channels, we also try to place important POP news and results in media channels operated by our customers, collaborators, and general HPC online news sites.

- Article "European Centres of Excellence EoCoE And POP Start Into Their Third Rounds", JSC News, 21 Feb 2024.
- Article "EoCoE and POP Centers of Excellence Begin 3rd Funding Phase with Focus on Exascale Computing in Energy and Performance Optimization", HPCwire, 23 Feb 2024

2.4.4 Events

Another important dissemination channel is attendance and presentations at high-level peer-reviewed conferences in fields such as HPC, supercomputing, computational science and parallel computing, and at European events like HiPEAC or CASTIEL2 events or the EuroHPC Summit Week. Presenting the latest updates and success stories of the project at such events, tutorials, meetings, or workshops is an effective means of involving community and industry leaders in standards discussions early on.

A short list of the events POP participated in can be found in section 2.2.1 of this document under the category "Events". We contributed by presenting the following talks or posters:

- Presentation "Energy Efficiency Metrics" by Ondřej Vysocký (IT4I), EuroHPC Summit 2024 session "How Does One Define an "Energy Efficient" HPC System? From Data to Action", Antwerp, Belgium, 18 Mar 2024
- Poster "POP3 Project" by Bernd Mohr (JSC), EuroHPC Summit 2024 Poster session, Antwerp, Belgium, 18 Mar 2024
- Presentation "ChEESE & POP3 CoE Collaboration" by Brian Wylie (JSC), EuroHPC Summit 2024, Elevate and Collaborate: European HPC NCCs and CoEs Workshop, Antwerp, Belgium, 21 Mar 2024
- Tutorial "Continuous Correctness Checking for HPC Applications" by Joachim Jenke (RWTH) and others, ISC High Performance, Hamburg, Germany, 12 May 2024.
- Tutorial "Determining Parallel Application Execution Efficiency and Scaling using the POP Methodology" by Marta Garcia-Gasulla and Sandra Mendez (BSC) and Brian Wylie and Anke Visser (JSC), ISC High Performance, Hamburg, Germany, 12 May 2024.
- Presentation "Short Introduction of the POP CoE" by Bernd Mohr (JSC), EuroHPC JU exhibition booth, ISC High Performance, Hamburg, Germany, 14 May 2024.

- Workshop "First International Workshop on Readiness of HPC Extreme-scale Applications", organized by Marta Garcia-Gasulla (BSC) and Brian Wylie (JSC), ISC High Performance, Hamburg, Germany, 1 6May 2024.
- Poster "POP3" by Radim Vavřík, Ondřej Vysocký and Lubomír Říha (IT4I), High Performance Computing in Science and Engineering 2024 conference ,Beskydy mountains, Czech Republic, 22 May 2024

At large events that offer an exhibition in addition to a technical program, such as SC in the USA and ISC-HPC in Germany, BSC, HLRS, IT4I, and JSC had exhibition booths showcasing their latest technology, including live-demos of visualizations of tools to attract visitors. This gave these partners and their results high visibility.

- ISC HPC 2024 Research exhibition booths, Hamburg, May 2024
  BSC (#L30), IT4I (#J22) or JSC/HLRS (#K02)
- SC 2024 Research exhibition booths, Atlanta, Nov 2024
  BSC (#3549), HLRS (#2231), IT4I (#4233) or JSC (#1443)

3. Training Report

The project partners have a long record of organising and contributing to training events where they teach the effective use of their tools for performance assessments. The spectrum of activities ranges from half- or full-day conference tutorials to tuning workshops lasting up to a week. Project partners BSC, HLRS, INESC-ID, IT4I, FZJ, RWTH, and UVSQ bundle their training activities in the framework of the Virtual Institute – High Productivity Supercomputing (VI-HPS, https://www.vi-hps.org), which offers effective advertisement channels, including a website, a mailing list, a "VI-HPS Tools Guide", and flyers. VI-HPS is an initiative of HPC tool builders in Europe and the USA, including universities, national labs, and companies. Next to the development of state-of-the-art productivity tools for high performance computing, VI-HPS also provides training in the efficient use of these tools. Both INESC-ID and IT4I/VSB joined VI-HPS in 2024.

Workshops and tutorials were orchestrated in close collaboration with the host organisation to fit the individual need of the audience. Training events can be a tuning workshop, a special bespoke workshop, or a tutorial conducted in collaboration with an HPC-related conference. VI-HPS Tuning Workshops are the major training vehicle where around 15 to 30 participants receive instruction and guidance applying VI-HPS tools to their own parallel application codes, along with advice for potential optimisations. Feedback to tools developers also helps direct tools development to user needs, as well as improve tool documentation and ease of use. VI-HPS has organised 46 Tuning Workshops since 2008 all over the world and will continue to organise these workshops of three to five days at HPC centres several times per year. These were complemented with additional courses and tutorials at conferences (e.g., ISC

HPC & SC), seasonal schools, and other invited training events. Coordinated tools training material is available with emphasis on hands-on exercises using VI-HPS tools individually and interoperably.

3.1 POP Training Events

POP training events (see Table 2) are organized, sponsored, and hosted by POP partners. In the reporting period, we organized the "Determining Parallel Application Execution Efficiency and Scaling using the POP Methodology" tutorial at the ISC HPC conference in Hamburg, Germany on May 12, 2024. This tutorial presented the methodology developed and applied over several years within the POP CoE.

Date	Location	Event
2024.05.12	Hamburg	ISC HPC Tutorial: POP methodology & tools

Table 2: POP Training Events

3.2 Training Events in cooperation with POP

POP training events in cooperation with POP (see Table 3) are co-organized and co-sponsored in cooperation between POP partners with other EU projects or organizations, mostly VI-HPS, along with CASTIEL2 or other CoEs. This is our preferred type of training activities because it shows the effective cooperation of organizations in the EU HPC ecosystem, and it re-uses rather than re-invents existing infrastructures.

Date	Location	Event	Co-Sponsor
2024.01.29 – 02.01	CALMIP Toulouse	43rd VI-HPS Tuning Workshop	
2024.02.26 – 03.01	RWTH Aachen + TU Dresden	44th VI-HPS Tuning Workshop	NHR/GSC, Helmholtz
2024.06.10 – 06.13	LRZ/TUM, Garching	45th VI-HPS Tuning Workshop	NHR/GCS
2024.09.04 – 09.06	IT4I/VSB Ostrava (Online)	46th VI-HPS Tuning Workshop / Training Sprint	CASTIEL2, NCC CZ

Table 3. Training in cooperation with POP

Notably, CASTIEL2 paired POP with NCC Czechia to organise a highly successful Training Sprint event, which ultimately also involved NCCs of Austria, Hungary, Poland, Slovakia and Slovenia. Over 60 participants registered from all over Europe, including 15 from EU-13 countries that are generally under-represented in training events. 12 of these participants requested accounts on Karolina where they could work through provided exercises and subsequently analyse their own application code executions on universal (CPU) and

accelerated (GPU) partitions. Several CoE flagship codes were analysed on both Karolina and other EuroHPC computer systems. This was also the first workshop where the POP methodology and tools of all POP partners were presented, with a recording available for future reference.

3.3 Training Events with POP contributions

Training events with POP contributions (see Table 4) are events organized, sponsored, and hosted by other organizations where POP experts were invited to contribute to parts of the program.

Date	Location	Event	Sponsor
2024.04.04 – 05.09	CS, Durham	Performance Analysis Workshop Series	DiRAC
2024.04.29 – 04.30	EPCC, Edinburgh	Scalasca/Score-P AMD GPU Workshop	Archer2
2024.10.07 – 10.09	BSC, Barcelona	6th MN-Hack	HPC-Now!
2024.10.07 – 10.11	JSC, Juelich	CASA GH Workshop	JARA/GCS
2024.10.28 – 10.31	CINECA, Bologna	GPU Programming Hackathon	EPICURE

Table 4. Training Events with POP contributions

4. Business Development Report

This section provides an update on the ongoing efforts to attract users to the POP3 services through a series of targeted business development initiatives.

Let us recall that POP3 aims to provide 120 services, of which 80 will support Centres of Excellence (CoE) and 40 non-CoE users such as SMEs, academic institutions and industry. Another objective of the project is to provide 12 services to SMEs out of the 40 non-CoE services.

With most of the CoEs already involved in the project, our business development strategy has focused on the identification of potential users: We are actively seeking industrial partners, research institutes and academic institutions to reach the target of 40 non-CoE users, including at least 12 SMEs. We are working with the CASTIEL2 project to attract additional CoEs who may not have been involved in our planned campaigns. In the next part, we will focus on activities to identify non-COE users.

To ensure effective lead management and communication, a shared Excel CRM has been implemented on the BSC B2drop platform (see Figure 11). Each

POP3 partner should actively seek out potential users and enter their details into the CRM when identifying and inviting them to apply for POP3 services. Furthermore, a targeted outreach campaign has been launched to re-engage previous POP1 and POP2 users and encourage their participation in POP3.

Performance Optimisation and Productivity
A Centre of Excellence in HPC

N°	First Name	Last Name	Email Address	Primary Address Country	Date Created	Week n°	Created By	Sector of lead	Organisation	Lead type
1	Pascal	De Resseguier	pascal.de-resseguier@nexiogroup.com	France	12/06/2024	Week 1	S.ZRIBI	Engineering	ENTARES Engineering - Nexio Group	SME
2	Charles	Ghavamian	sg@necs.fr	France	12/06/2024	Week 1	S.ZRIBI	Engineering	NECS	SME
3	Thomas	Homolle	thomas.homolle@michelin.com	France	12/06/2024	Week 1	S.ZRIBI	Manufacturing	Michelin	Large Industrial
4	Damien	Dubuc	ddubuc@aneo.fr	France	12/06/2024	Week 1	S.ZRIBI	Information Technology (IT)	Aneo	SME
5	Charles	Leca	charles.leca@lemma-ing.com	France	13/06/2024	Week 1	S.ZRIBI	Information Technology (IT)	Lemma	SME
6	Ramzy	Boussetta	ramzy.boussetta@michelin.com	France	13/06/2024	Week 1	S.ZRIBI	Manufacturing	Michelin	Large Industrial
7	Andreas	Kaufmann	Andreas.Kaufmann@synopsys.com	Germany	12/06/2024	Week 1	S.ZRIBI	Information Technology (IT)	Synopsys	Large Industrial
8	David	van Bebber	dvanbebb@ford.com	Germany	13/06/2024	Week 1	S.ZRIBI	Engineering	Ford Forschungszentrum Aachen	Large Industrial
9	Rainer	Wiesenfarth	rainer_wiesenfarth@trimble.com	Germany	13/06/2024	Week 1	S.ZRIBI	Information Technology (IT)	Trimble Germany GmbH	Large Industrial
								Medical and		

Figure 11. Snapshot of the CRM shared file

Due to the significant engagement with CoEs at the beginning of the project, active prospecting for non-CoE users began in mid-June 2024. Since this date, we sent out 146 invitations to a wide range of contacts in different sectors and countries, inviting them to apply for POP3 services. Our initial focus was on industrial companies, including SMEs. Figure 12 shows the leads by sector of activity.

We also leveraged the "calcul" mailing list to promote POP3 services to French researchers in scientific computing. As shown in Figure 12 the main contacts belong to Energy, IT and computing centres.

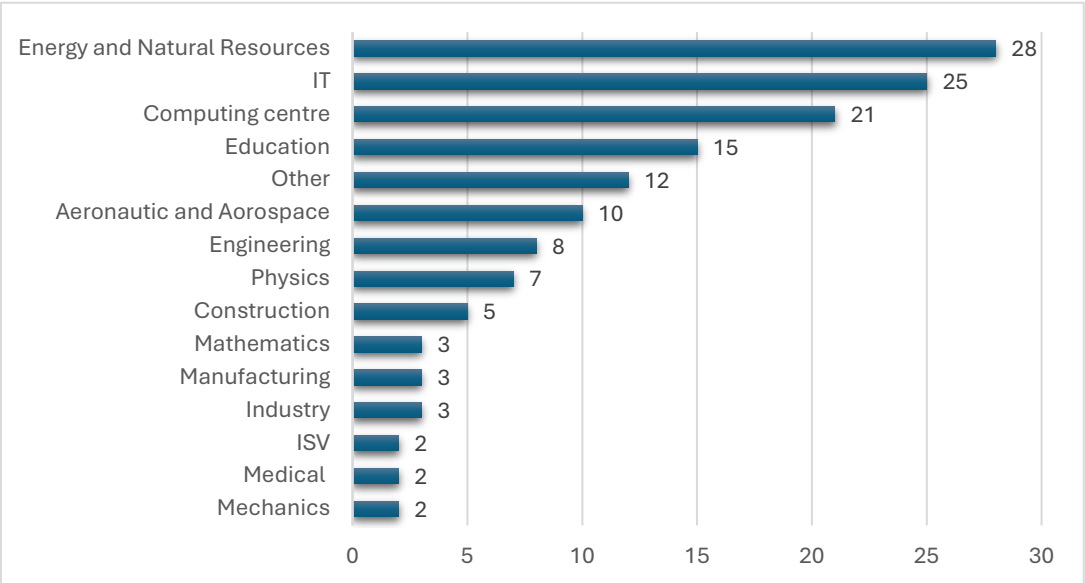

Figure 12: POP3 Leads by Sector Type

France and Germany have been the primary focus of our outreach efforts, with a significant number of prospects identified in these countries. Other European nations, including Luxembourg, Spain, Italy, the Netherlands, Hungary, Portugal, Norway, Croatia, and Switzerland, have also been targeted, though to a lesser extent, as showcased in Figure 13.

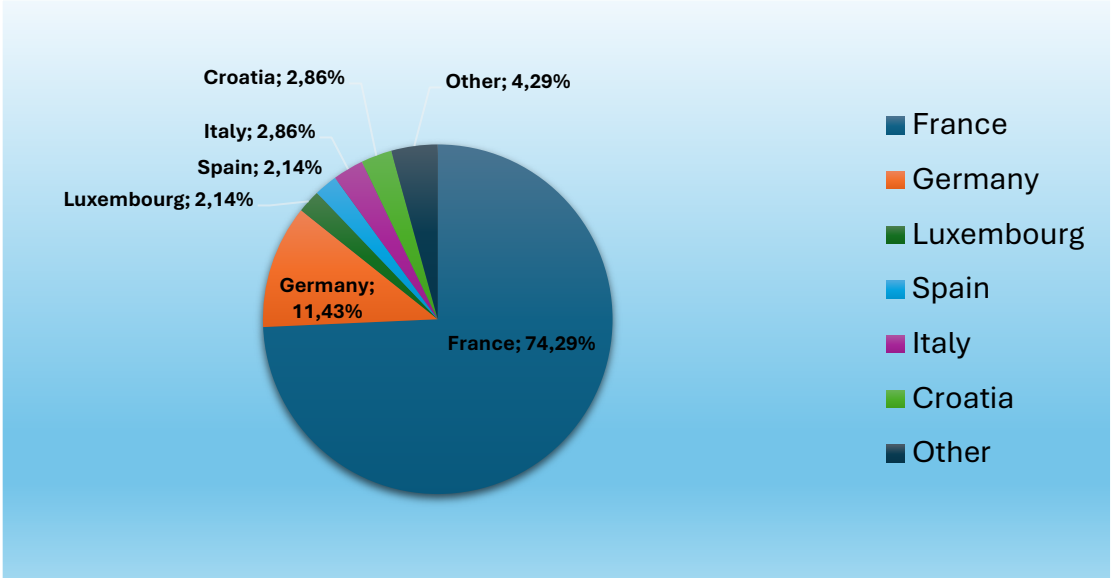

Figure 13: Geographical Distribution of POP3 Leads

Most leads originate from large industries and academia, with strong interest also coming from SMEs. Other sectors, including research institutions, government agencies, and professional associations, have been targeted as well, as shown in Figure 14.

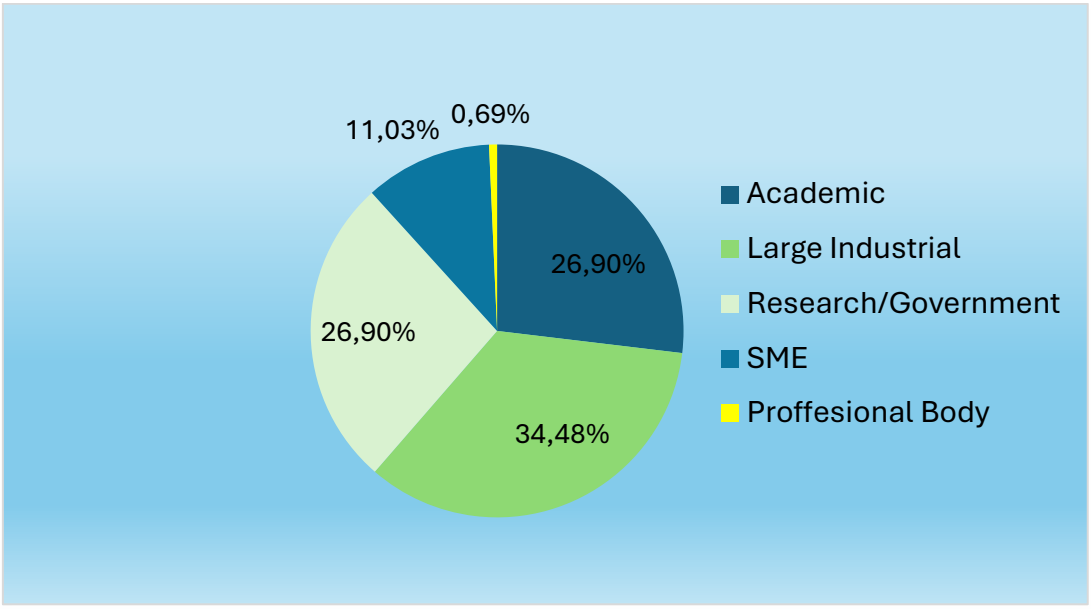

Figure 14: Leads by type

In order to attract new users, we initiated a collaboration with the CASTIEL 2 and EuroCC 2 projects. This partnership started with active participation in the annual CASTIEL 2 meeting held in Slovakia in April 2024. During this meeting, we discussed the services offered by POP3 and the application process with representatives of the COEs and NCCs.

In addition, a webinar was organised specifically for NCCs on 25 September 2025. This webinar presented the services offered by POP3 and highlighted the benefits for parallel code developers. The presentation was supported by POP2 success stories. Around 40 people attended the webinar. Each NCC was encouraged to promote POP3 services within their national community.

Although our prospecting efforts started in last June and are still in progress, we have already achieved a significant milestone by recruiting 9 non-COE users.

To enhance our user acquisition efforts, we will refine our target audience, diversify our outreach channels and strengthen our collaboration with CASTIEL 2 and EuroCC 2. This will include targeting industry associations and leveraging relevant events to engage with SMEs and other potential users across Europe. Events include the EuroHPC Summit in March 2025 and the Teratec Forum at the end of May 2025.

5. Exploitation Report

POP3 will continue and expand the successful exploitation activities introduced in the first and second phases of the POP CoE. In addition to the direct exploitation of POP expertise by shortening the runtime of HPC applications via our Performance Assessment and 2nd-level services (see https://pop-coe.eu/services), this will be done in the following directions.

Powerful HPC tools: The POP usage plan provides for significant contributions to the development of several free and open-source software solutions. The following software is maintained and extended as part of the project:

- Scalasca [3-clause BSD License] (FZJ)
  - Trace Tools
  - Cube
  - Cube POP Advisor
- BSC performance tools [GNU Lesser General Public License] (BSC)
  - Paraver
  - Extrae
  - Dimemas
  - Basic analysis
  - Clustering
  - Tracking
  - Folding

- Score-P [3-clause BSD License] (FZJ, RWTH)
- MAQAO and OneView [GNU Lesser General Public License] (UVSQ)
- MERIC and RADAR visualizer [3-clause BSD License] (IT4I@VSB)

User support in HPC centres: The unified methodology and improved HPC tools developed in this project will enable the HPC centres (BSC, IT4I, HLRS, JSC and RWTH) to offer high-level services to the scientific community using their HPC systems. The knowledge gained from the work in POP3 will also strengthen their position in international fora such as ETP4HPC, JLESC or others.

Scientific Publications: The partners as scientific institutions will publish their results in peer-reviewed journals and at conferences. It is intended to publish jointly to a large extent. If possible, open access publication models will be used.

Training: The project partners have a long history of organising regular training events to teach the use of their own HPC systems and how to use their HPC tools effectively as instruments for performance evaluation. The spectrum of activities ranges from half-day or one-day conference tutorials to tuning workshops lasting up to a week. Furthermore, the project partners University of Stuttgart, FZ Jülich and RWTH, together with several other international partners, are bundling their training activities within the framework of the Virtual Institute - High Productivity Supercomputing (VI-HPS, www.vi-hps.org), which offers effective promotional channels, including a website, a mailing list, a 'VI-HPS Tools Guide' and flyers. VI-HPS is an initiative of fourteen HPC tool vendors from Europe and the US, including universities, national research centres and companies. POP3 will enable these activities to continue and expand.

Events: POP3 will actively participate in at least ten European events to disseminate project results. A list of possible events is presented in the POP3 deliverable "Dissemination and Exploitation Plan" D2.2, in Chapter 4, Table 5. The ISC (www.isc-hpc.com) in Germany, the SC (www.supercomputing.org) in the USA and the EuroHPC Summit Week in Europe are just a few examples. Participation in conferences for academic and industrial HPC users is also planned.

Business development: To attract the interest of HPC users and developers of scientific and engineering simulation applications to the POP3 services, they will be reached via direct marketing, social media and by participating in in-person or digital events. POP3 will also rely on the Digital Innovation Hubs (DIHs), the industry associations and the recently established National Competence Centres (NCCs) to expand the POP user community and reach potential new customers.

Co-design: Another notable activity being undertaken in POP3 is co-design, which involves the collection of data on common performance issues in HPC applications and the development of a set of kernels derived from real

applications, each of which represents a fundamental performance behaviour. POP3 will maintain and improve the POP website in connection with this activity.

This will provide hardware architects and system software designers from other EU projects with quantitative data to help assess the potential impact of the architectural or software approaches they are using. The kernels also constitute valuable training materials and examples of the advantages of the programming model features and practices promoted by POP CoE.

In parallel, POP3 will provide application-oriented input and feedback to the developers of the hardware and software platform as part of the European Processor Initiative (EPI). The emphasis will be on three EPI projects: the RHEA ARM processor, the VEC RISC-V accelerator and the STX (Stencil/AI) accelerator. After identifying key applications, we will conduct experiments with simulators and early prototypes, and then analyse the architecture and compiler to identify strengths and weaknesses. Our goal is to share our findings with hardware designers and compiler developers for integration into current or future generations of processor microarchitectures and software toolchains.

6. Conclusion

The project continued the successful POP branding and dissemination plan established by POP1 and POP2. POP news, outcomes, and results were successfully disseminated through the POP blog on the POP website and our social media channels. The quarterly E-mail Newsletter as well as the POP webinar series was continued.

Training activities also successfully continued like in POP1 and POP2. After the Covid-19 crisis, which affected very much POP2, training events were finally changed back to in-person events. We organised 1 training event, co-organised another 4 in cooperation with VI-HPS and contributed to 5 training events organised by other organisations. 86 participants of hands-on trainings learned the POP methodology to apply our tools to their application codes; many more (100+) followed presentations or accessed recordings of the training.

Finally, POP3 continued and expanded the successful business development and exploitation activities introduced in the first and second phases of the POP CoE. Main exploitation results are contribution to the open-source development of our POP performance analysis tools, establishment of a standardised POP methodology, co-design and extraction of kernels, and collaboration with hardware developers (EPI).

Acronyms and Abbreviations

- CA – Consortium Agreement
- CAdv – Customer Advocate
- CRM – Customer Relationship Management
- D – deliverable
- DoA – Description of Action (Annex 1 of the Grant Agreement)
- EC – European Commission
- EuroHPC – European High Performance Computing Joint Undertaking
- GA – General Assembly / Grant Agreement
- HPC – High Performance Computing
- IPR – Intellectual Property Right
- KPI – Key Performance Indicator
- M – Month
- MS – Milestones
- NCC – National Competence Center
- PEB – Project Executive Board
- PM – Person month / Project manager
- POP – Performance Optimization and Productivity
- POP1 – POP CoE first phase (2015 – 2018)
- POP2 – POP CoE second phase (2019 – 2022)
- POP3 – POP CoE current phase (2024 – 2026)
- R – Risk
- RV – Review
- VI-HPS – Virtual Institute High-Productivity Supercomputing
- WP – Work Package
- WPL – Work Package Leader

<u>POP3 Beneficiaries</u>

- BSC: BARCELONA SUPERCOMPUTING CENTER - CENTRO NACIONAL DE SUPERCOMPUTACION
- FZJ: FORSCHUNGSZENTRUM JÜLICH GMBH
- RWTH: RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE AACHEN
- IT4I@VSB: TECHNICAL UNIVERSITY OF OSTRAVA
- INESC ID: INSTITUTO DE ENGENHARIA DE SISTEMAS E COMPUTADORES, INVESTIGACAO 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

List of Figures

List of Tables