POP CoE Services

Marta Garcia-Gasulla, BSC
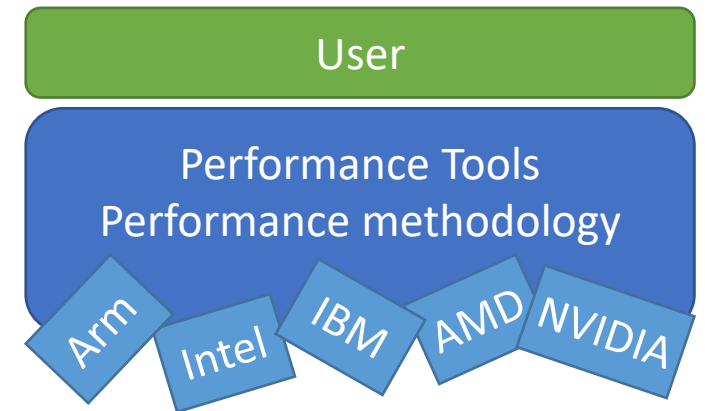
Context and history

- **POP-CoE** starts in 2015

- Objectives:
  - To offer performance analysis services to European HPC users.
  - To develop a common methodology for performance analysis

- **POP1** runs from October 2015 to March 2018

- **POP2** runs from December 2018 to June 2022

- **POP3** will run between January 2023 and December 2026

User

Performance Tools
Performance methodology

Arm Intel IBM AMD NVIDIA

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Partners

- **Who?**
  - BSC (coordinator), ES
  - HLRS, DE
  - JSC, DE
  - INES-ID, PT
  - RWTH Aachen, IT Center, DE
  - TERATEC, FR
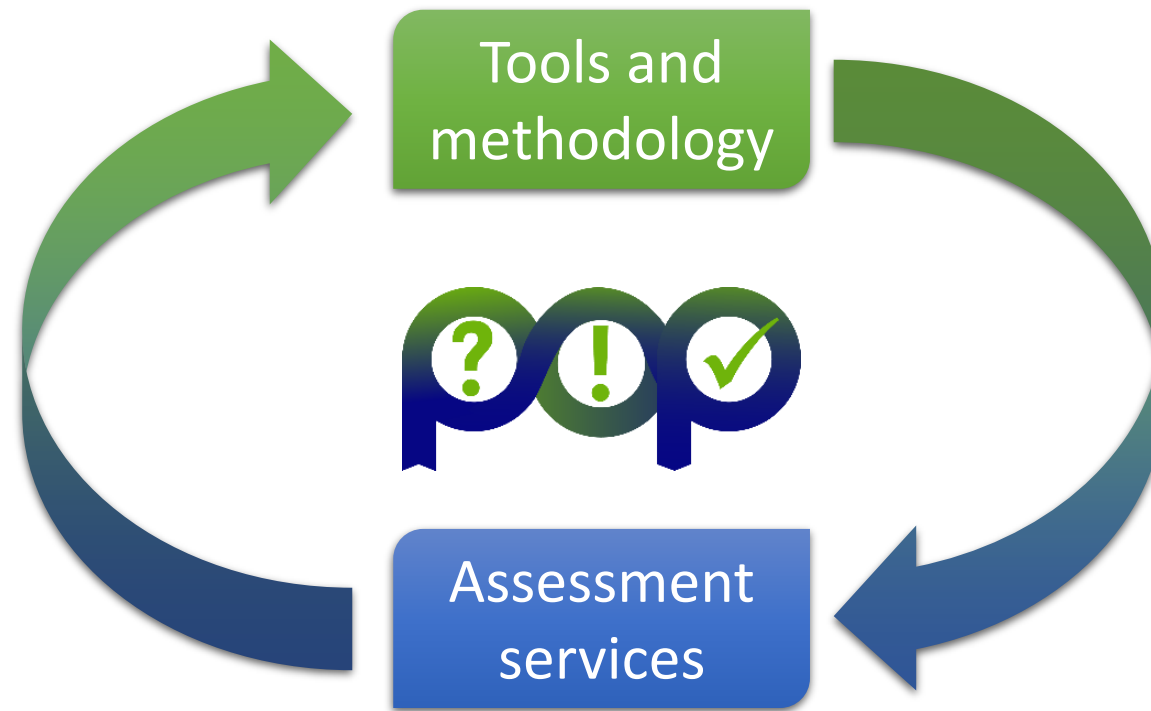 - IT4I, CZ
  - UVSQ, FR

A team with

- Excellence in performance tools and tuning
- Excellence in programming models and practices
- Research and development background AND
  proven commitment in application to real academic and industrial use cases

Objectives

Assessment services

Tools and methodology

Objectives

Services provided by the CoE

? **Parallel Application Performance Audit** ⇨ **Report**

- ➢ Primary service
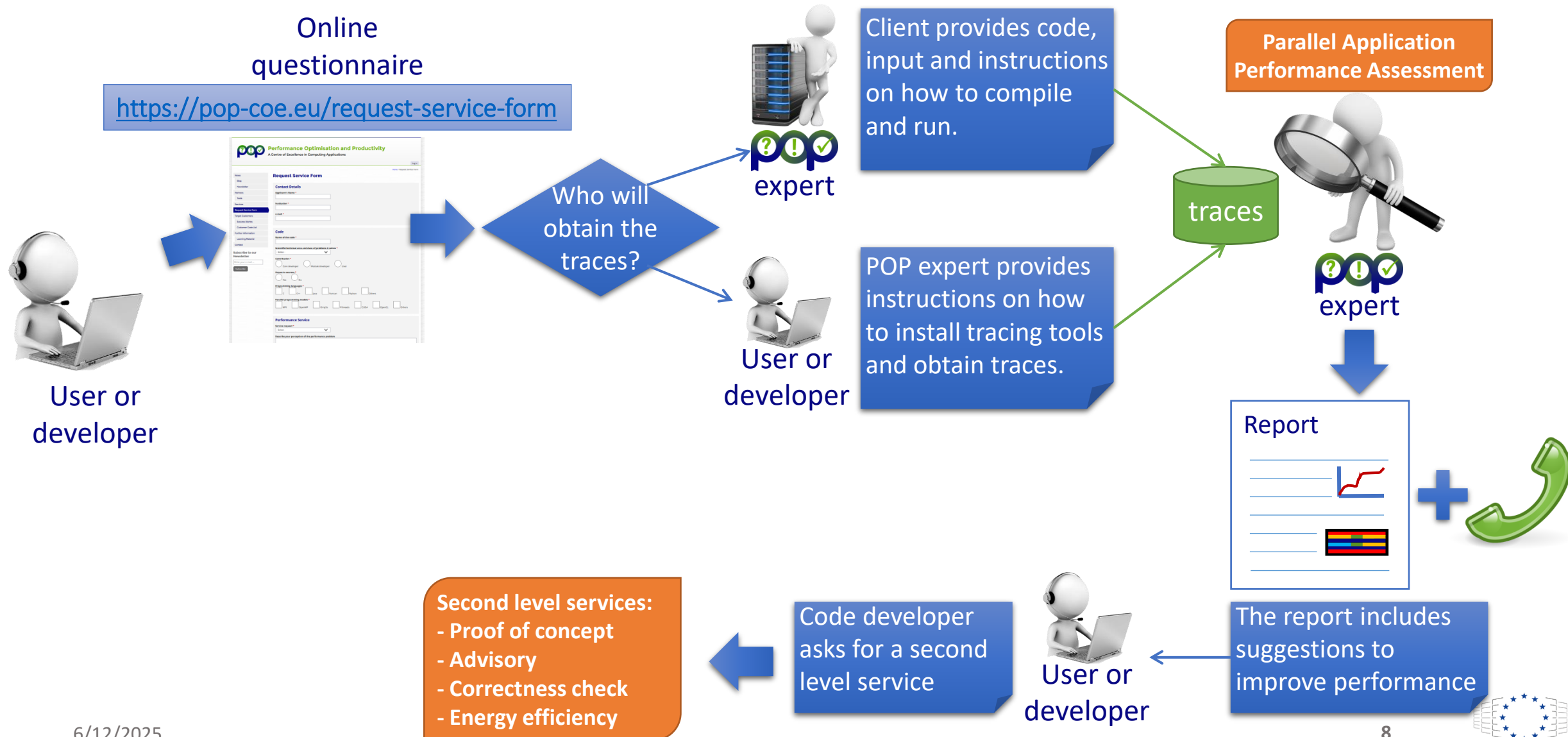- • Identify performance issues of customer code (at customer site)

! ✓ **Second level Services** ⇨ **Report**

- ➢ More specific depending on the demand of the customer
- • Proof-of-concept (⇨ **Software demonstrator)**
- • Energy efficiency audits
- • Correctness checks
- • Advisory study

POP3 services

Online questionnaire

https://pop-coe.eu/request-service-form

User or developer

Who will obtain the traces?

expert

Client provides code, input and instructions on how to compile and run.

User or developer

POP expert provides instructions on how to install tracing tools and obtain traces.

traces

Parallel Application Performance Assessment

expert

Report

The report includes suggestions to improve performance

User or developer

Code developer asks for a second level service

Second level services:
- **Proof of concept**
- **Advisory**
- **Correctness check**
- **Energy efficiency**

6/12/2025

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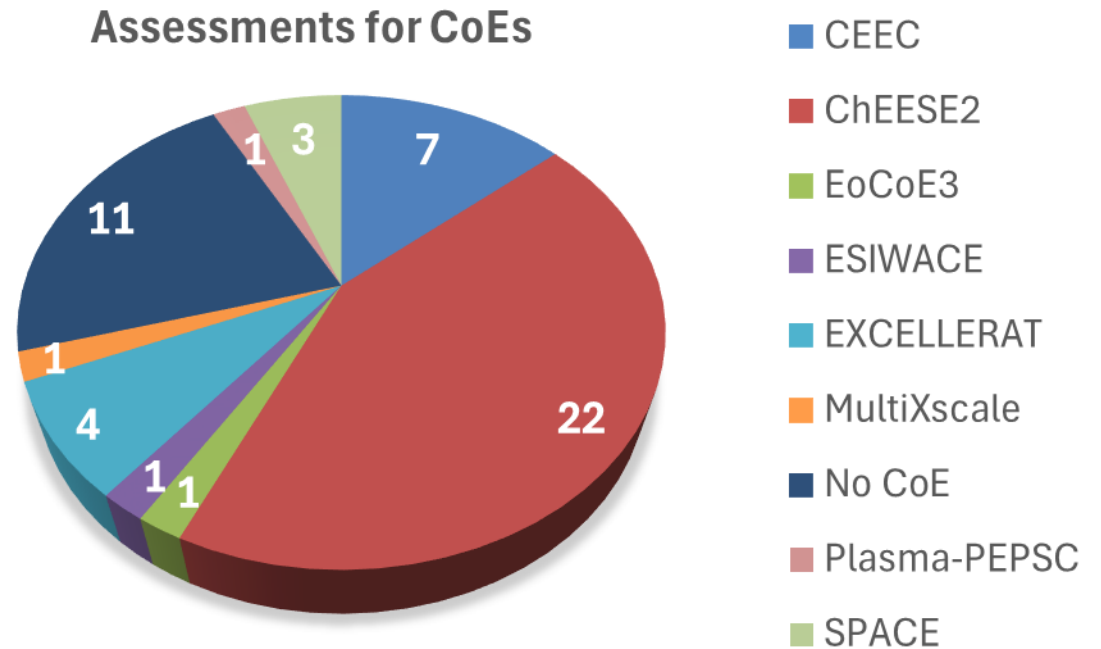
Collaboration with other CoEs

- Campaigns
  - 2 ChEESE2
  - 1 CEEC
- Individual codes
  - EoCoE3
  - ESiWACE
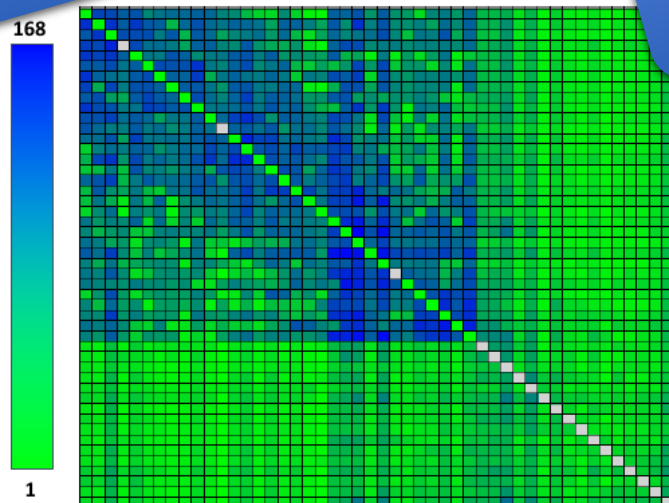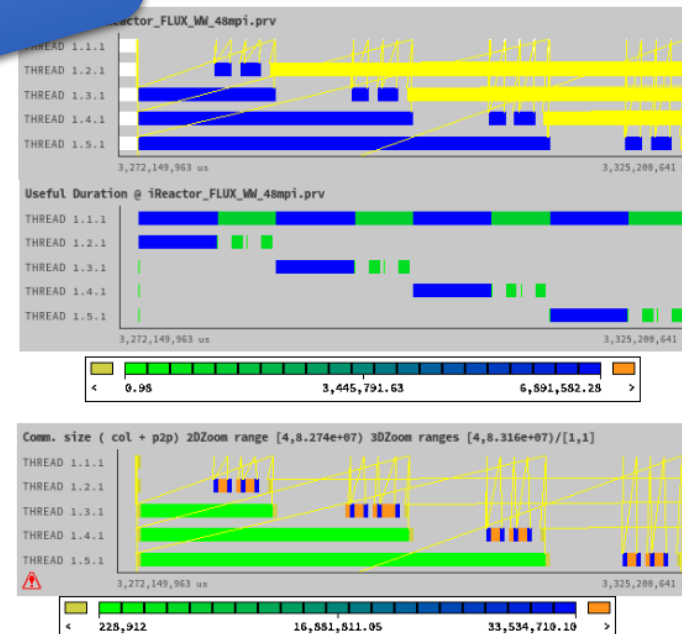 - EXCELLERAT
  - MultiXscale
  - Plasma-PEPSC
  - SPACE

Assessments for CoEs

- CEEC
- ChEESE2
- EoCoE3
- ESiWACE
- EXCELLERAT
- MultiXscale
- No CoE
- Plasma-PEPSC
- SPACE

Our excellence

From high level metrics...

Number of processes	1	2	4	8	12	24	48
└Parallel efficiency	100.00	96.18	94.77	94.27	88.65	80.59	73.19
└Load balance	100.00	96.27	95.42	95.28	91.98	90.56	90.03
└Communication efficiency	100.00	99.91	99.32	98.94	96.39	88.99	81.29
└Computation scalability	100.00	97.38	95.49	93.58	89.61	85.26	83.88
└IPC scalability	100.00	99.29	98.60	97.73	96.48	95.23	93.19
└Instruction scalability	100.00	97.76	96.40	95.39	92.52	91.51	90.57

...that tell you where to look

To detailed views...

...to provide insight

To summarize...

- We provide services to European HPC users
  - But we focus on CoEs
    - Through campaigns
    - Or individual assessments

- We have tools to
  - Analyze at large scales
  - Provide efficiency metrics
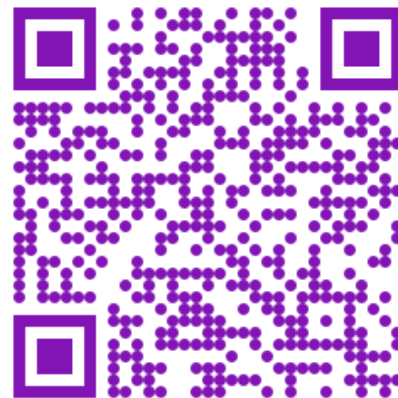 - Give detailed insight

What is next...

MNHACK25
7th MareNostrum Hackathon

Date: 13-15 October
Place: BSC (Barcelona, Spain)
Registration: Free, with limited spots

Registration and more information here

Request an assessment here or ask us...

Performance Optimisation and Productivity 3
A Centre of Excellence in HPC

Contact:

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𝕏 @POP_HPC

▶ youtube.com/POPHPC

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