Training on POP performance analysis, methodology and tools for and by women and other underrepresented groups in HPC

Online, 17th-19th May 2022

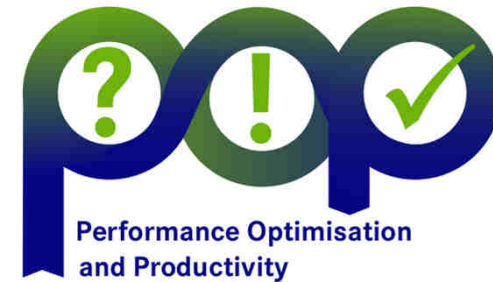EU H2020 Centre of Excellence (CoE)

Grant Agreement No 824080

1 December 2018 – 30 November 2021

The team (In order of appearance)

- Marta Garcia-Gasulla (Barcelona Supercomputing
  - BSC tools
- Radita Liem (RWTH Aachen University)
  - BSC and JSC tools
- Anke Visser (Jülich Supercomputing Centre)
  - JSC tools
- Christina Muehlbach (TU Dresden)
  - VAMPIR
- Judit Gimenez (Barcelona Supercomputing Center)
  - BSC tools
- Sandra Mendez (Barcelona Supercomputing Center)
  - BSC tools

The agenda - Tuesday

- 9:30   Welcome
  - Introduction to POP
  - Introduction to VI-HPS
  - Introduction to JUSUF and Jupyter

- 11:00   (break)

- 11:15   JSC performance tools
  - Score-P and Scalasca

- 13:00   (lunch)

- 14:00   Hands-on
  - Coaching to apply JSC Tools to analyze participants' own code(s)

- 16:00   (adjourn)

The agenda - Wednesday

- 9:30   POP Methodology
- 10:30   PAPI Hardware counters
- 11:00   (break)
- 11:15   Vampir
- 12:00   Scalasca and Score-P advanced
- 13:00   (lunch)
- 14:00   Hands-on
  - Coaching to apply Vampir, PAPI and JSC tools
- 17:00   (adjourn)

The agenda - Thursday

- 9:30   BSC tools
  - Extrae, Paraver, Dimemas and BasicAnalysis
- 11:00 (break)
- 11:15 Cont. BSC tools
- 13:00 (lunch)
- 14:00 Hands-on
  - coaching to apply the BSC tools to participants' code
- 16:00 (adjourn)

Some logistics

- Questions are welcome during presentations
- However, join Slack channel for communicating with trainers and other participants
  - Ask there any technical issue you experience
- 1 more email to come:
  - Post-training
- Afternoon break-out rooms
- Any other issue?
  - Slack channel or email organizers

Performance Optimization and Productivity CoE in 5 minutes

Marta Garcia-Gasulla, BSC

Partners

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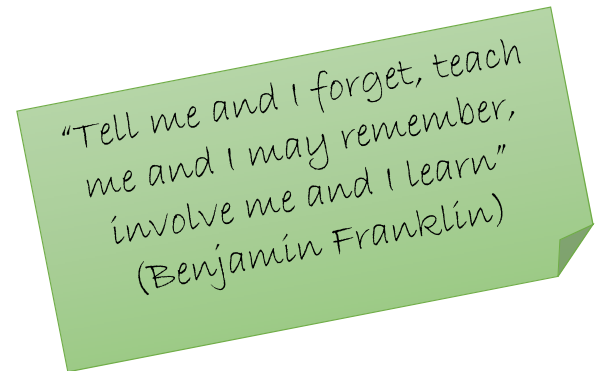 - RWTH Aachen, IT Center, DE
  - TERATEC, FR
  - UVSQ, FR

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
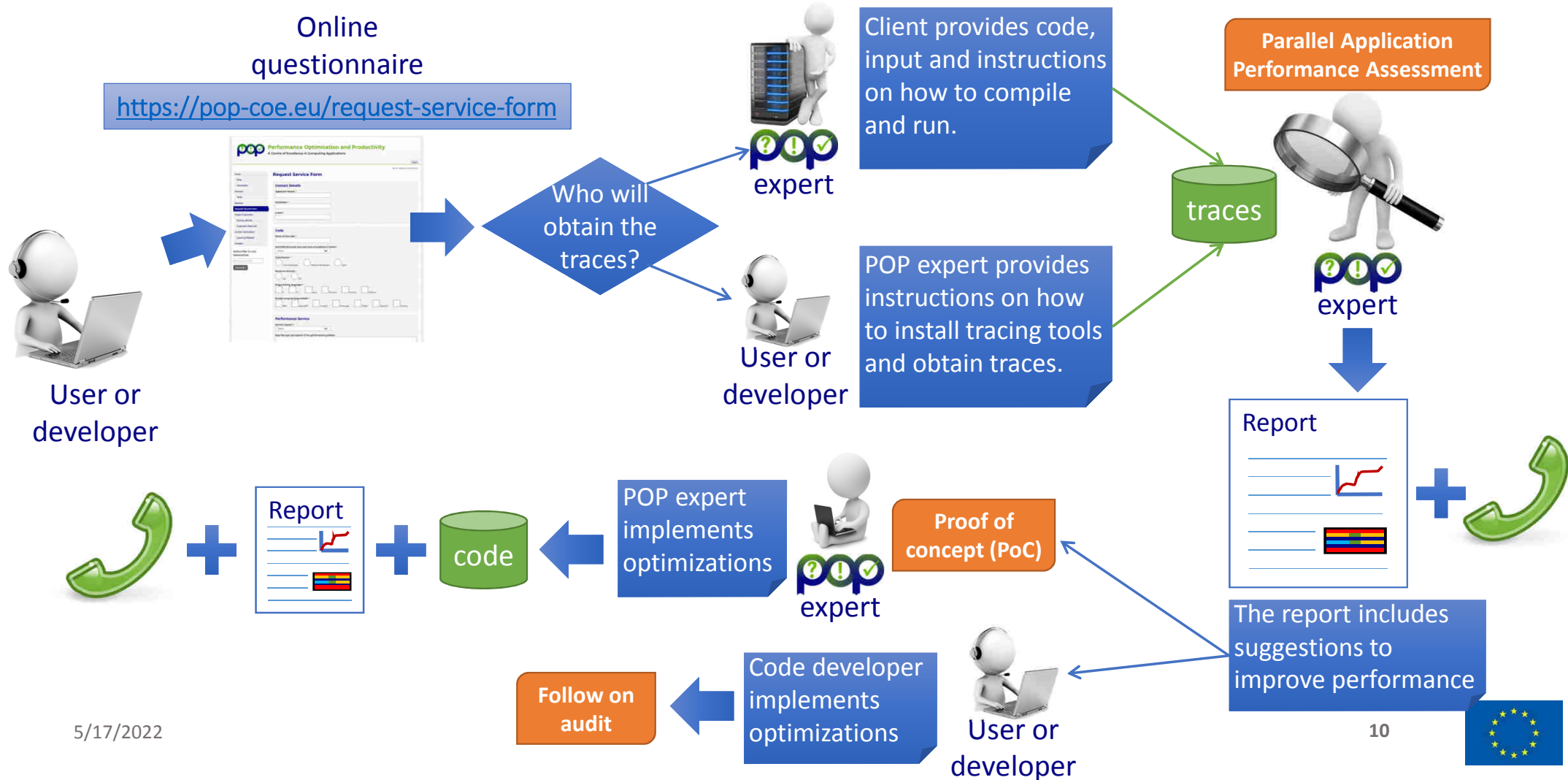
POP CoE

- A **Centre of Excellence**
  - On **Performance Optimisation and Productivity**
  - Promoting **best practices in parallel programming**
  - POP: October 2015 – March 2018
  - POP2: December 2018 – May 2022
  - POP3: ?

- Providing **FREE** **Services**
  - Precise understanding of application and system behaviour
  - Suggestion/support on how to refactor code in the most productive way

- **Horizontal**
  - **Transversal** across application areas, platforms, scales

- For (EU) **academic** AND **industrial** codes and users !

"Tell me and I forget, teach me and I may remember, involve me and I learn"
(Benjamin Franklin)

POP 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.

Parallel Application Performance Assessment

traces

expert

Report

The report includes suggestions to improve performance

Proof of concept (PoC)

User or developer

POP expert implements optimizations

code

expert

Report

Code developer implements optimizations

Follow on audit

POP CoE

- **POP** and **POP2** success story
  - More than **300 performance analysis**
    - **Unique** view on status of European HPC codes
    - **90%** of users **satisfied** or **very satisfied** with the service

  - More than **40 Proof-of-concepts**
    - **All** customers **satisfied** or **very satisfied**

  - **Co-design** public repository
    - https://co-design.pop-coe.eu
    - Patterns, Best practices and kernels

  - Continuous development of **tools** and **methodology** for performance analysis

  - **Training** activities
    - 24 Online webinars

Performance Optimisation and Productivity
A Centre of Excellence in HPC

Contact:

https://www.pop-coe.eu

mailto:pop@bsc.es

@POP_HPC