



# European HPC Landscape

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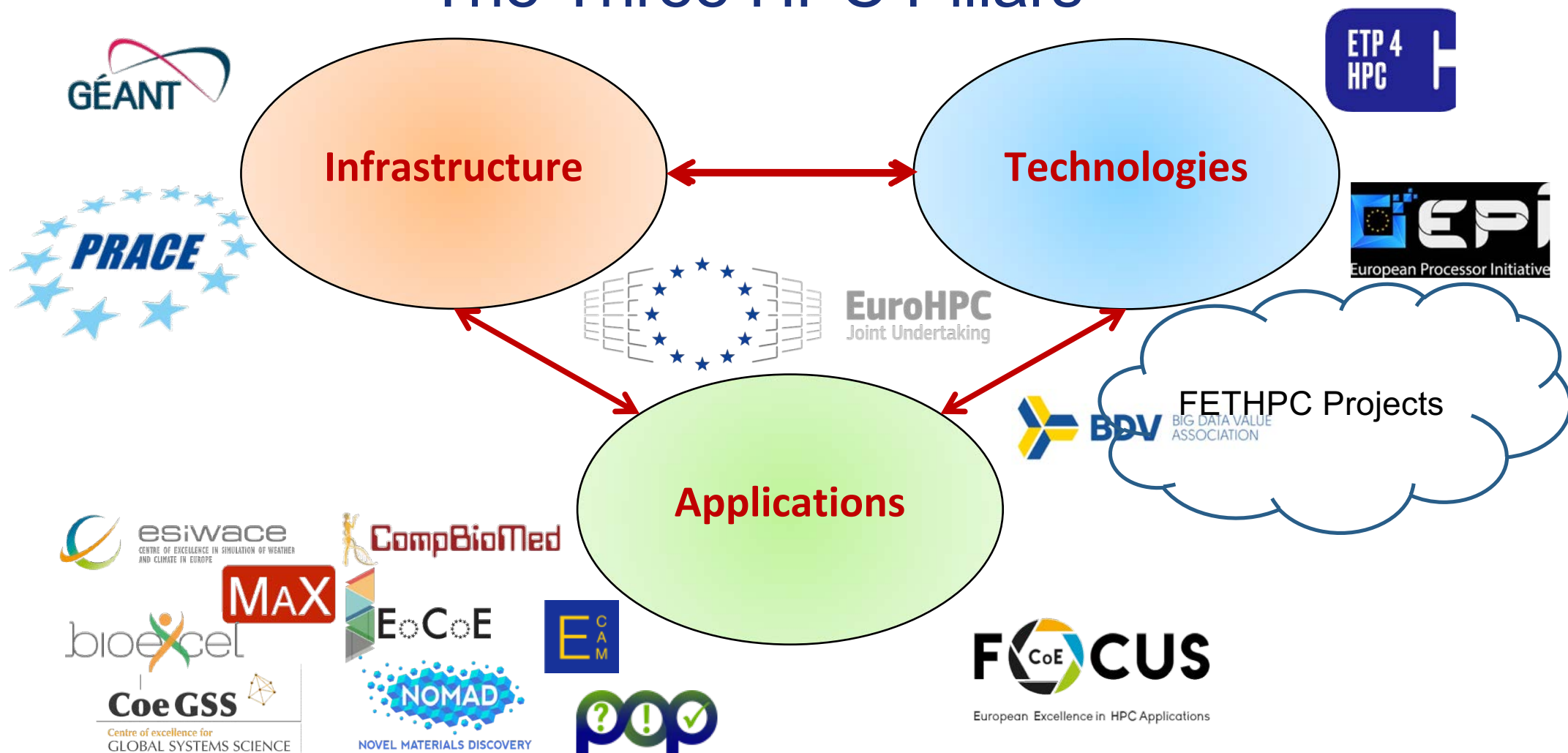
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# Overview

1. The Three HPC Pillars
2. Survey
3. Results & Examples
4. HPC Portal

# The Three HPC Pillars





# Survey

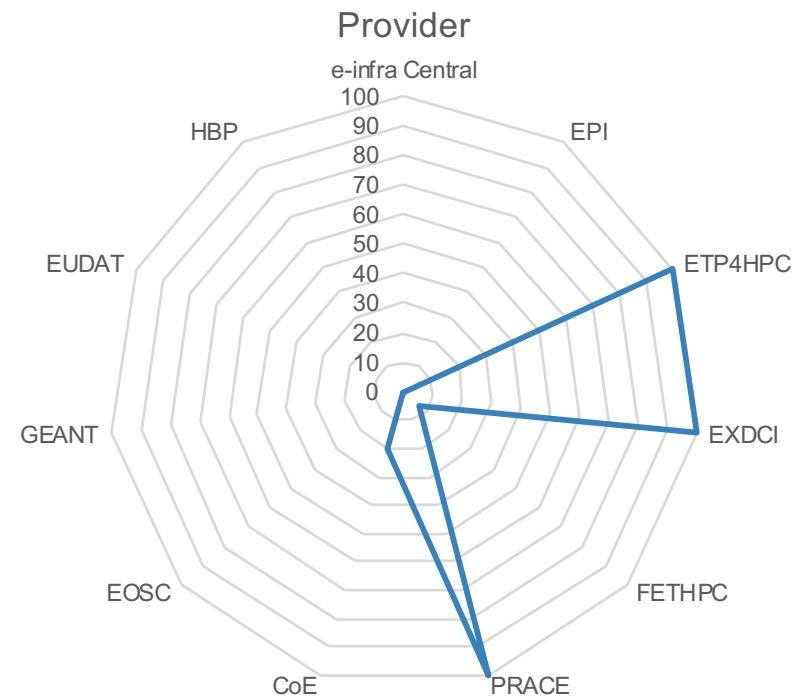
- ▶ Survey was sent to 81 contacts (coordinators of CoE, FETHPC projects, EuroHPC, ETP4HPC, BDVA, GÉANT, FocusCoE, EPI, EOSC, EUDAT, OpenAire, eInfraCentral, EXDCI)
- ▶ 38 answers were received
  - ▶ 10 from CoE (Center of Excellences, application oriented center)
  - ▶ 15 FETHPC (Future and Emerging Technology on HPC)
  - ▶ EOSC (European Open Science Cloud) , EPI (European Processor Initiative), HBP (Human Brain Project), FocusCoE (Coordination CoE), GÉANT (European academic network of network), ETP4HPC (European Technology Platform on HPC), PRACE (Partnership for HPC in Europe)
  - ▶ EuroHPC missing
- ▶ High response rate of nearly 50%

# The HPC Ecosystem Matrix

	Developer	Coordinator	Provider	User/Beneficiary	Enabler
<b>HPC Policy</b>					
<b>HPC Technology (industry, hard &amp; soft)</b>	<ul style="list-style-type: none"> <li>Developer: institution in charge of preparing materials for the development activity</li> <li>Coordinator: institution in charge of collecting materials from developers and of coordinating their implementation</li> <li>Provider: institution in charge of providing the services to execute the activity</li> <li>User/beneficiary: institution that benefits from the activity</li> <li>Enabler: institution that enables the activity by providing the necessary services that are not part of the core of the activity</li> </ul>				
<b>HPC Computing Services</b>					
<b>HPC Training</b>					
<b>HPC Application Enabling and User Support</b>					
<b>HPC Research</b>					

## Result (1/6): HPC Policy

- ▶ No input from EuroHPC
- ▶ Indicate to provide HPC policy
  - ▶ CoE (2/10)
  - ▶ ETP4HPC (1/1)
  - ▶ FETHPC (1/15)
  - ▶ EXDCI (1/1)

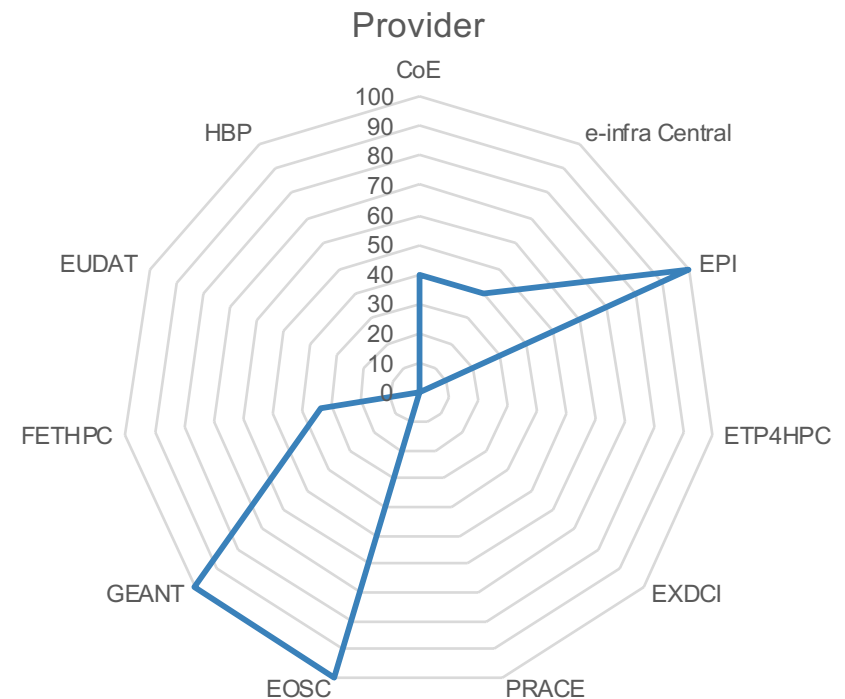




## Result (2/6): HPC Technology

### ► Indicate to provide HPC technology

- *CoE* (4/10)
- *eInfraCentral* (2/5)
- *EPI* (1/1)
- *FETHPC* (5/15)
- *GÉANT* (1/1)
- *EOSC* (1/1)

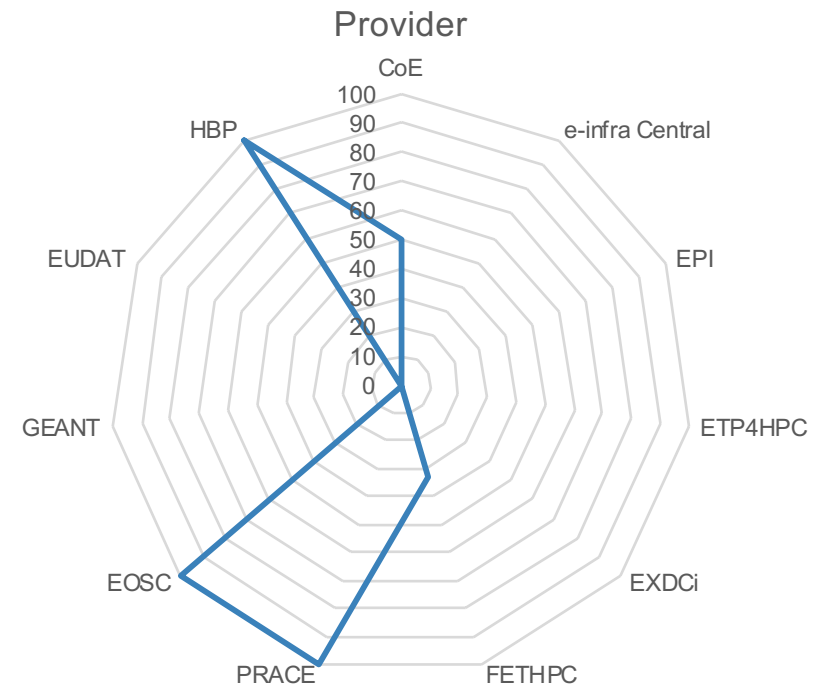


# Result (3/6): HPC Computing Services

## ► Indicate to provide HPC services\*

- *PRACE (1/1)*
- *eInfraCentral (0/5)*
- *CoE (5/10)*
- *FETHPC (5/15)*
- *EOSC (1/1)*
- *HPB (1/1)*

\* *provide access to HPC compute resources*



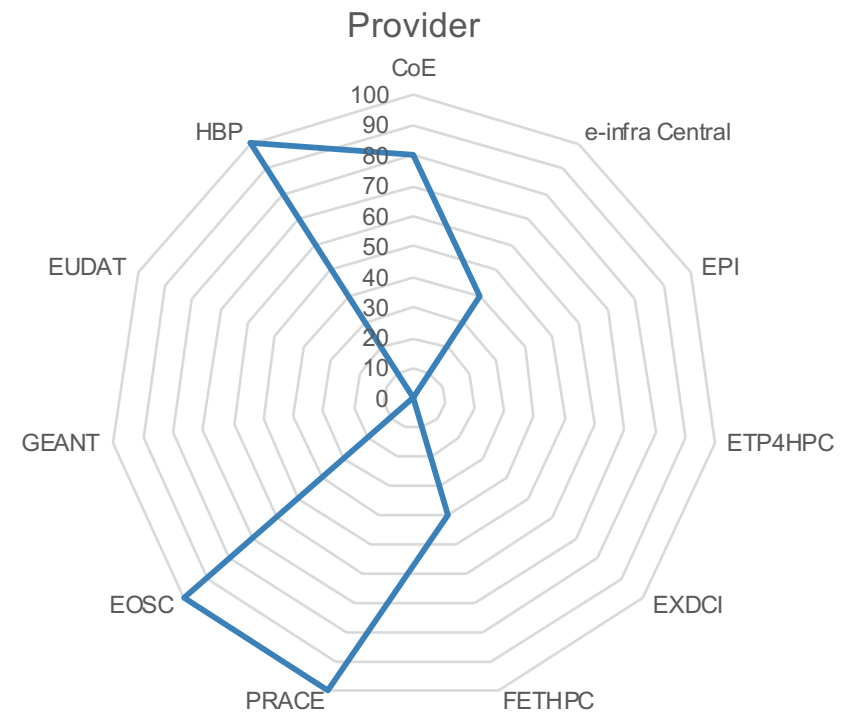




## Result (4/6): HPC Training

### ► Indicate to provide HPC Training

- PRACE (1/1)
- eInfraCentral (2/5)
- CoE (8/10)
- FETHPC (6/15)
- EOSC (1/1)
- HPB (1/1)

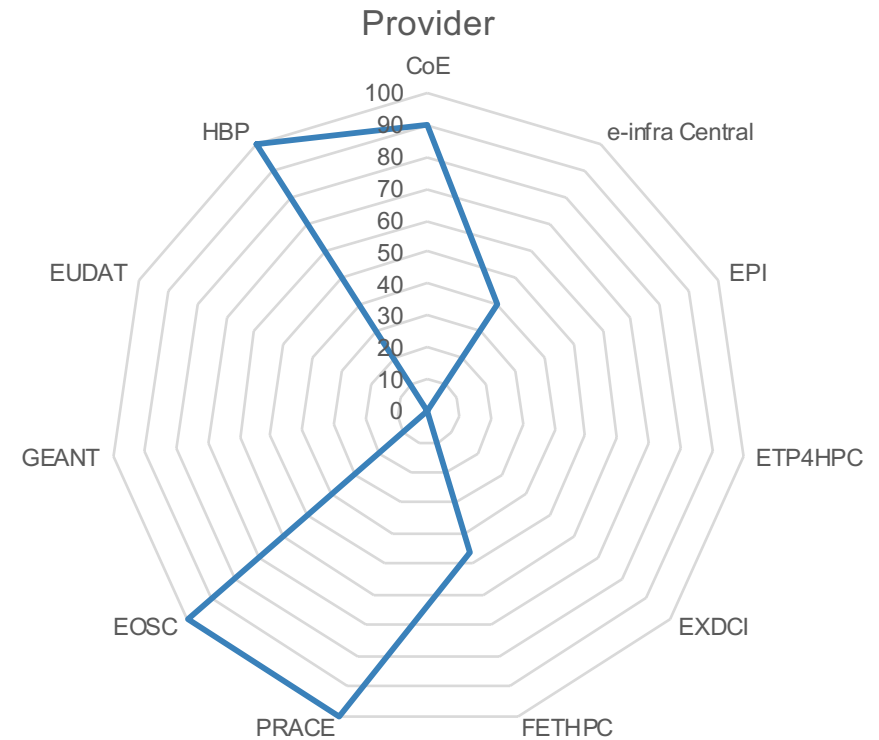




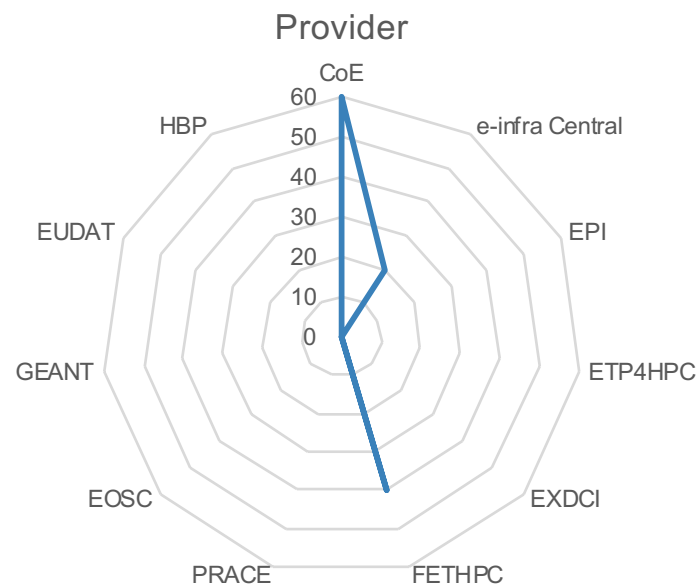
# Result (5/6): HPC Application Enabling and User Support

## ► Indicate to provide HPC application enabling

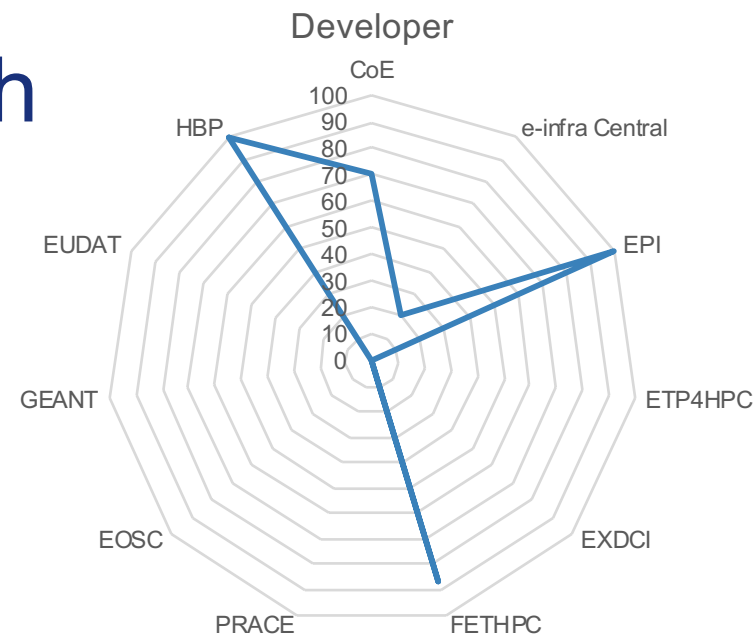
- *PRACE* (1/1)
- *einfraCentral* (2/5)
- *CoE* (9/10)
- *FETHPC* (7/15)
- *EOSC* (1/1)
- *HPB* (1/1)



# Result (6/6): HPC Research



- ▶ Indicate to provide HPC research
  - ▶ CoE (6/10)
  - ▶ eInfraCentral (1/5)
  - ▶ FETHPC (6/15)



- ▶ Indicate to develop HPC research
  - ▶ CoE (7/10)
  - ▶ eInfraCentral (1/5)
  - ▶ FETHPC (13/15)
  - ▶ EPI (1/1)
  - ▶ HBP (1/1)



# Example 1 for Coordination: Training

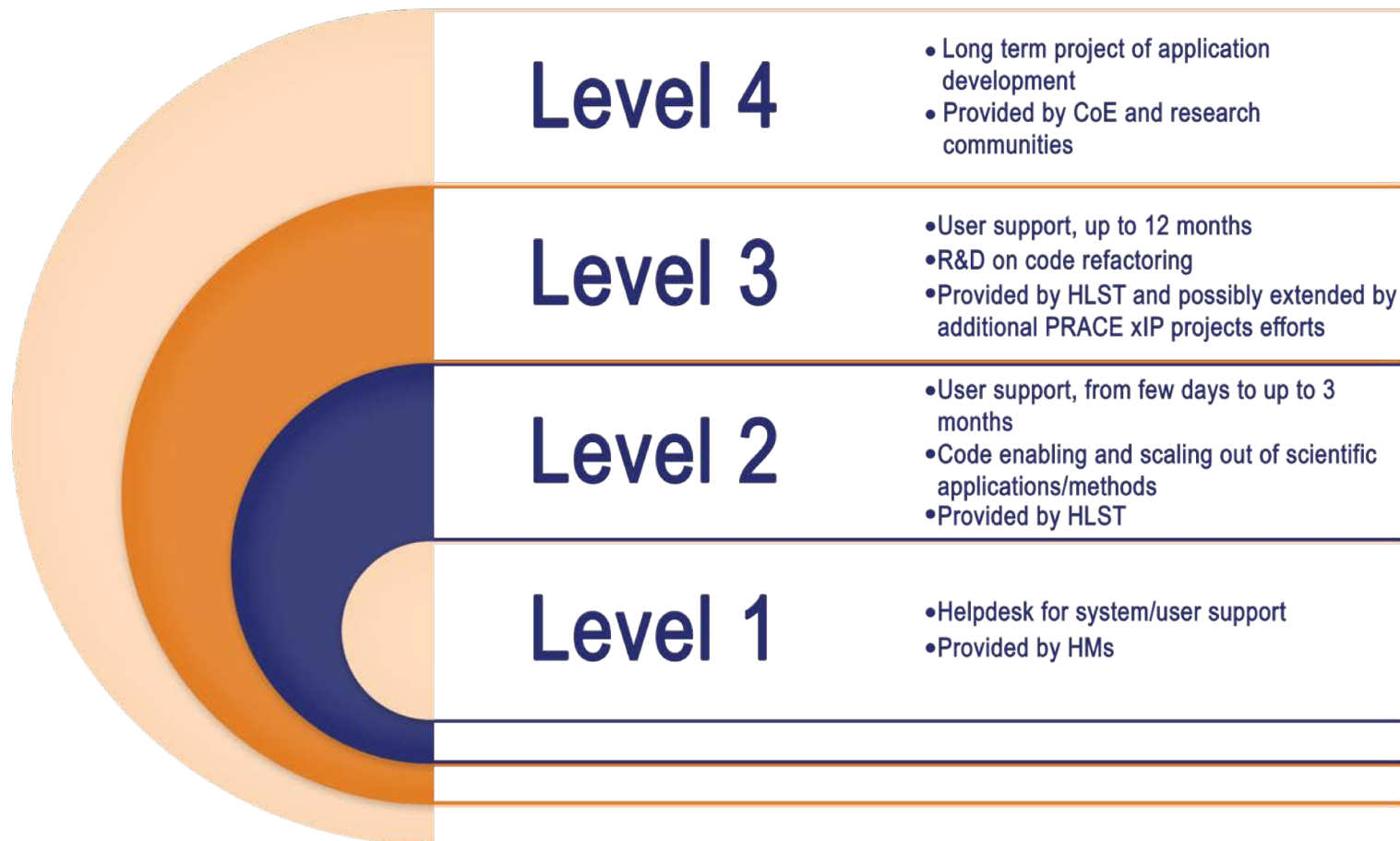
- ▶ Many actors provide training
- ▶ PRACE Training portfolio:
  - ▶ Regular Courses – PRACE Training Centers (PTCs)
  - ▶ Workshops: Seasonal Schools, on demand events, Int. HPC Summer School
  - ▶ Online Training: Training Portal, MOOCs, CodeVault
  - ▶ PRACE Summer of HPC
- ▶ Trainings from HBP, EOSC and FETHPC identified as independent and complementary
- ▶ Overlap between PRACE and CoE
  - ▶ PRACE training focus on general and cross-disciplinary HPC topics,
  - ▶ CoEs training focus on topical trainings.



# Example 2 for Coordination: HPC Application Enabling and User Support

- ▶ Four support levels
- ▶ Provided by: PRACE, HBP, CoE, EOSC, (eInfraCentral, FETHPC)
- ▶ User Support provided by HBP, EOSC; FETHPC and eInfraCentral independent and complementary
- ▶ PRACE provides:
  - ▶ Support for Preparatory Access
  - ▶ High Level Support Teams
- ▶ Overlap between PRACE and CoE
  - ▶ PRACE offers user support for all users and disciplines,
  - ▶ CoEs only provide support, if specific case is of interest for the CoE, not prepared to offer support as a regular service
  - ▶ POPperformance analysis by the POP CoE

# Example 2 for Coordination: HPC Application Enabling and User Support







# Portal HPC in Europe

## ► Background

### ► The EC has issued

- *a wide variety of scattered requests to coordinate the various HPC services across Europe (HPC access, training, support ...)*
- *to various projects and initiatives (PRACE, ETP4HPC, PRACE-5IP, EXDCI, FocusCOE, ... )*

## ► Objective

- To discuss a solid basis for a common HPC in Europe portal that would (hopefully) answer these requests, and also would serve to build through a bottom-up approach on the coordination of the European HPC services



# Portal HPC in Europe

- ▶ The concept
  - ▶ The portal should serve as a centralised database that can be accessed by all stakeholders
- ▶ HPC services
  - ▶ HPC access, training and support – others?
- ▶ HPC audiences/ target groups
  - ▶ Researchers, Industry, Communities, Students – others? General public?



# Portal HPC in Europe

- ▶ The concept
  - ▶ The portal should serve as a centralised database that can be accessed by all stakeholders
    - ▶ *Convenient to administrators*
    - ▶ *Automatic import*
    - ▶ *Avoid data duplication*
    - ▶ *Requires integration of data sources*
    - ▶ *Branding, neutral*
    - ▶ *Acknowledgement to contributors*



# Portal HPC in Europe

## ► The concept

- The portal should serve as a centralised database that can be accessed by all stakeholders
  - *Responsibility of the data*
    - *Sanity checks?*
  - *EOSC experience – the place to be*
  - *Roles and permissions*
  - *Technical: Aggregation vs hosting – different solutions for each category*
  - *Engage FocusCOE and ETP4HPC (as big actors)*



# Portal HPC in Europe

- ▶ The objective
  - ▶ To create and make available a framework for stakeholders to use
- ▶ Not the objective
  - ▶ To fill the portal with all the data
- ▶ How this differentiate from EOSC/eInfraCentral
  - ▶ Effort required
  - ▶ Standardisation



# Portal HPC in Europe

- ▶ HPC audiences/ target groups
  - ▶ Definitions needed
  - ▶ Service-based audiences
    - ▶ *Researchers, Industry, Communities, Students*
  - ▶ Content-based audiences
    - ▶ *Decision makers*
    - ▶ *General public (use cases)*





# Portal HPC in Europe

- ▶ HPC services
  - ▶ HPC access, training and support
    - ▶ *Data services, up to a certain extent*
  - ▶ Technology, according to EC view
  - ▶ Ticket processing service
    - ▶ *Requires sustained effort and appropriate knowledge*
    - ▶ *Requires proper definition of responsibilities*
    - ▶ *Also as a mechanism to future portal enhancements*
  - ▶ Requirements/constraints/feature on services:
    - ▶ *Lifecycle of services*
    - ▶ *Pay-per-use services*

[Access](#)[Training](#)[Support](#)[Technology](#)[Resources](#)

## Researchers

- Access to HPC systems
- HPC support
- Advanced Training
- Prototypes

[See all offer](#)

## Industry

- Access to Tier-0
- SHAPE
- Commercial HPC services
- Training for industrial users

[See all offer](#)

## Students in HPC

- Summer schools
- Summer of HPC
- HPC for beginners
- MOOCs in HPC

[See all offer](#)

## HPC Communities

- Evaluation access to Tier-0
- Access to FENIX RI
- On-demand training

[See all offer](#)

## General audience, stakeholders and policy makers

- |                  |                |             |         |
|------------------|----------------|-------------|---------|
| • Map of systems | • CodeVault    | • Use cases | • Media |
|                  | • White Papers | • Events    | • EPI   |

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Access to HPC systems  
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## General



- [Topical](#)
  - [On-demand](#)
  - [SoHPC](#)
  - [MOOCs](#)
  - [Mobility](#)
  - [MOOCs in HPC](#)
- [See all offer](#)



## MOOCs



## Mobility



MOOCs in HPC

[See all offer](#)



## Industry

- [Access to Tier-0](#)
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## General audience, stakeholders and policy makers

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## Researchers

- Access to HPC systems
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## General

## Topical



## Industry

- Access to Tier-0
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## HPC Communities

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## Prototypes

- Access to HPC systems
- SHAF
- Comm
- Traini



## Software



## EPI

[See all offer](#)

## HPC

- Evalu
- Acces
- On-de

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# HPC in Europe

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Introduction to European Training in HPC, including explanation of training levels, domains and any other relevant details

Training event	dates	level	Target	Registration
Training in whatever		Advanced	   	<a href="#">Registration</a>
SoHPC		Beginner		<a href="#">Registration</a>
On-demand training events		Intermediate/ advanced		<a href="#">Registration</a>
Training in something else		Intermediate	 	<a href="#">Registration</a>
				<a href="#">Registration</a>

Filters by ...

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# Conclusions

- ▶ Interesting exercise – understand better your friends
- ▶ European HPC Portal
  - ▶ Work in progress
  - ▶ Your comments are welcome
  - ▶ Plan to have 1<sup>st</sup> version online by Q1 2020



# THANK YOU FOR YOUR ATTENTION

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