



EUROPEAN
TECHNOLOGY
PLATFORM
FOR HIGH
PERFORMANCE
COMPUTING

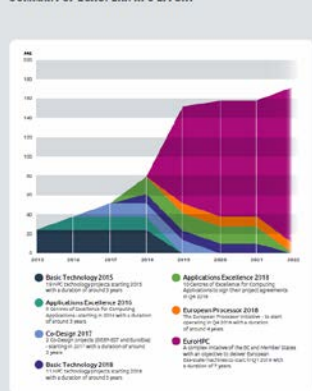


ETP 4
HPC

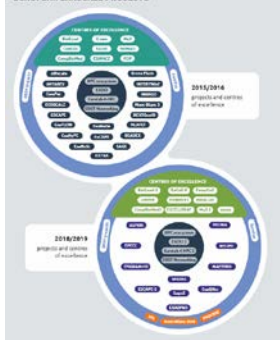
Post-Exascale Vision

Marcin Ostasz, ETP4HPC Office

SUMMARY OF EUROPEAN HPC EFFORT



EUROPEAN EXASCALE PROJECTS



> 150 Project Results in various domains

FET projects: ~150 results for various domains and usages

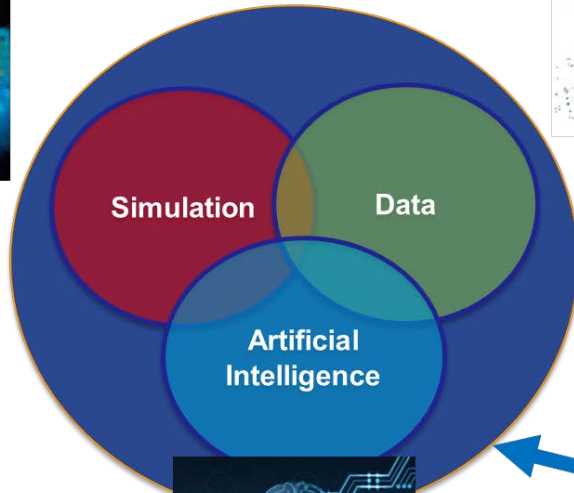
Project	Competing technology	Business Model	Strategic system	Task for FET	Software stack	Programme model used	Deployment mode	Library	Application
Exascale 100	Exascale 100	Exascale 100	Exascale 100	Exascale 100	Exascale 100	Exascale 100	Exascale 100	Exascale 100	Exascale 100
Exascale 200	Exascale 200	Exascale 200	Exascale 200	Exascale 200	Exascale 200	Exascale 200	Exascale 200	Exascale 200	Exascale 200
Exascale 300	Exascale 300	Exascale 300	Exascale 300	Exascale 300	Exascale 300	Exascale 300	Exascale 300	Exascale 300	Exascale 300
Exascale 400	Exascale 400	Exascale 400	Exascale 400	Exascale 400	Exascale 400	Exascale 400	Exascale 400	Exascale 400	Exascale 400
Exascale 500	Exascale 500	Exascale 500	Exascale 500	Exascale 500	Exascale 500	Exascale 500	Exascale 500	Exascale 500	Exascale 500
Exascale 600	Exascale 600	Exascale 600	Exascale 600	Exascale 600	Exascale 600	Exascale 600	Exascale 600	Exascale 600	Exascale 600
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Exascale 800	Exascale 800	Exascale 800	Exascale 800	Exascale 800	Exascale 800	Exascale 800	Exascale 800	Exascale 800	Exascale 800
Exascale 900	Exascale 900	Exascale 900	Exascale 900	Exascale 900	Exascale 900	Exascale 900	Exascale 900	Exascale 900	Exascale 900
Exascale 1000	Exascale 1000	Exascale 1000	Exascale 1000	Exascale 1000	Exascale 1000	Exascale 1000	Exascale 1000	Exascale 1000	Exascale 1000

PRACE-GEO FET/FP7 EXO TRAINING
 November 13, 2018

What is next?

- **Why** do we need a Vision?
- What are the **foundations** of our Vision?
- **What** is it going to do?

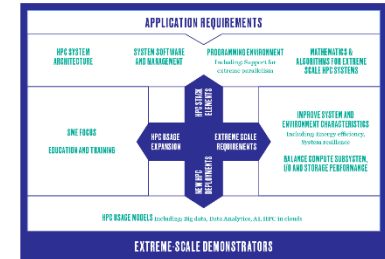
Why do we need a Vision – The role of HPC in the future?



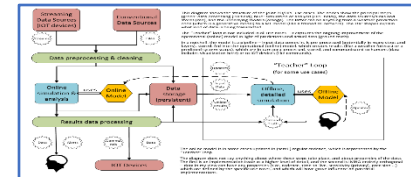
Interacting with the world:
Intertwined with
Cognitive and Physical System requirements



???



New Workflows e.g. Autonomous car



The Foundations of the Vision – Step 1: let's hear what the world has to say...

CAMBRIAN EXPLOSION OF COMPUTING AND BIG DATA IN THE POST-MOORE ERA

Satoshi Matsuoka

Director, RIKEN Centre for Computational Science (R-CCS) - Professor, Dept. Mathematical & Computing Sciences, Tokyo Institute of Technology



FUTURE HPC: THE INTEGRATION OF SIMULATION, DATA ANALYSIS AND MACHINE LEARNING

Rick Stevens

Professor at the University of Chicago and Associate Laboratory Director at Argonne National Laboratory



HPC IN THE LOOP AND CYBER-PHYSICAL SYSTEMS

Marc Duranton

Member of the List institute of the Research and Technology Department of CEA



FROM THE LATENCY TO THE THROUGHPUT AGE

Jesus Labarta

Director of the Computer Sciences Department at Barcelona Supercomputing Center (BSC)



BIG DATA AND EXTREME COMPUTING (BDEC) DISTRIBUTED SERVICES

Daniel A. Reed

University Chair in Computational Science & Bioinformatics, Pr. of Computer Science, Electrical & Computer Engineering, & Medicine, University of Iowa



AN ARCHITECT'S VIEW ON TECHNOLOGY CHALLENGES AND OPPORTUNITIES IN HPC

Al Gara

Intel Fellow and Chief Architect in the Data Center Group at Intel Corporation



FROM BRAIN RESEARCH TO FUTURE TECHNOLOGIES

Dirk Pleiter

Research Group Leader, Jülich Supercomputing Centre (JSC)



Upstream technologies

- quantum computing
- new memory/storage
- nanoelectronics
- photo-electronics

Societal Challenges



<p>“Missions” (Horizon Europe) e.g.: “Halving the human burden of dementia by 2030”, e.g.: “Reach net zero greenhouse gas emissions balance of 100 European cities by 2030”</p>	<p>“Thematical Clusters” (Horizon Europe)</p> <ul style="list-style-type: none">• Health,• Inclusive and Secure society,• Digital and Industry,• Climate Energy and Mobility,• Food and Natural Resources
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Application and use scenarios (Simulation, Analytics, AI, IOT)



Applications development: design, algorithms, methods, languages, tools



Technology for HPC Systems: architectures, hardware, software, algorithms, programming, tools,

What is it going to do? –

HPC Work Programme definition

Vision



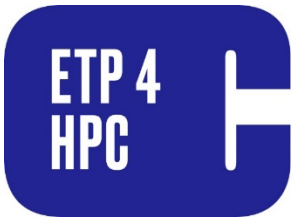
Courtesy FHG

European Industrial Users



ETP4HPC IUWG: Value Proposition
ETP4HPC is the connecting link for industrial HPC users into EuroHPC and provides a platform for collaboration and relationship building including neighbour domains BigData, AI, IoT

ETP4HPC | EuroHPC | November 2018



EUROPEAN TECHNOLOGY PLATFORM FOR HIGH PERFORMANCE COMPUTING



Work Programme



PROJECTS and Results