

EuroEXA

Co-designed Innovation and System for Resilient Exascale Computing in Europe: From Applications to Silicon

Presenter – Paul Carpenter

Barcelona Supercomputing Center

paul.carpenter@bsc.es

Leader WP2 Applications and Software Technical Manager, EuroEXA

Leader WP3 Enablement of Software Compute Node, ExaNoDe



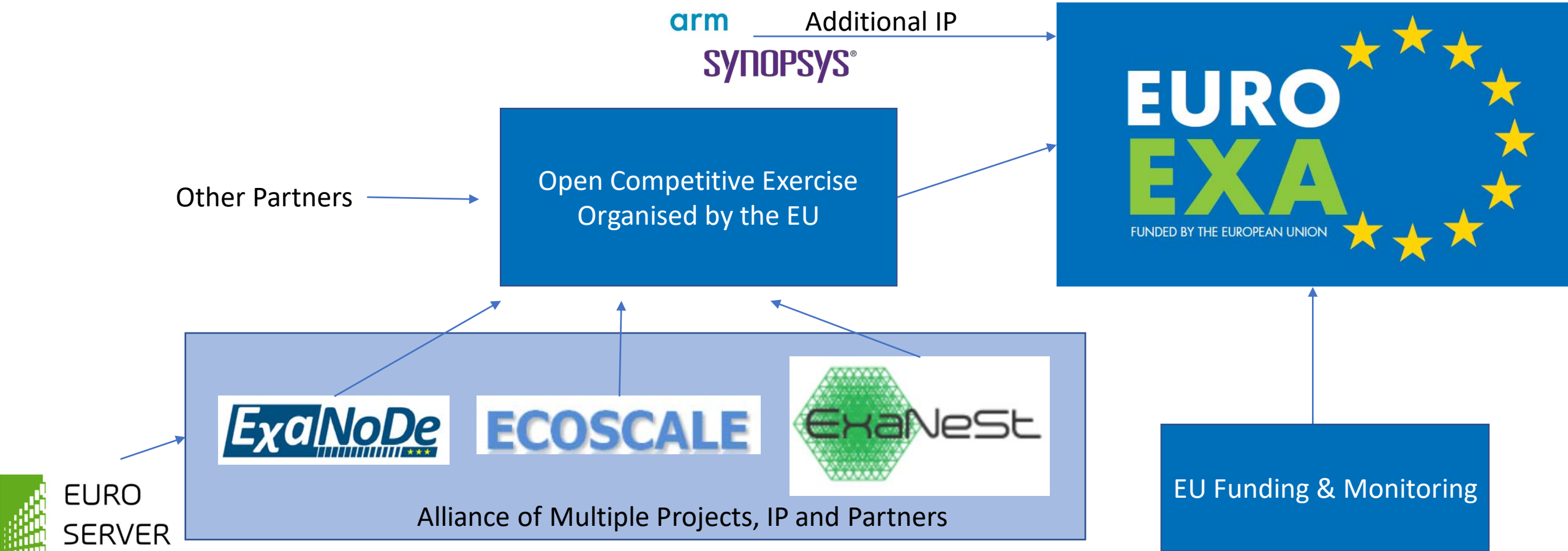


Commercial Partners

Academic/Gov. Partners

Supporters

- H2020 FETHPC-01-2016
- September 2017 – February 2021 (3.5 years)
- Budget €20 M



Co-design and demonstrate 1 PF+ testbed in operational environment

Three testbeds to be deployed at STFC, Daresbury

Testbed 1



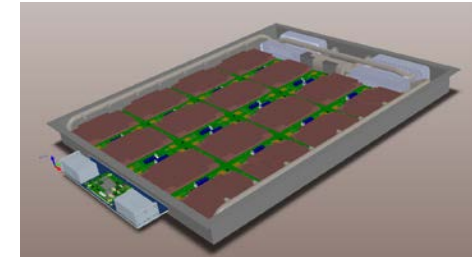
50 nodes of ExaNeSt technology for **software development**

Testbed 2



~500 co-designed nodes and new infrastructure technologies to **test scaling**

Testbed 3



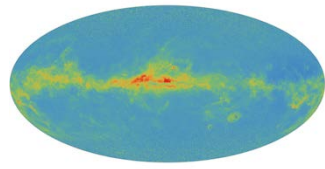
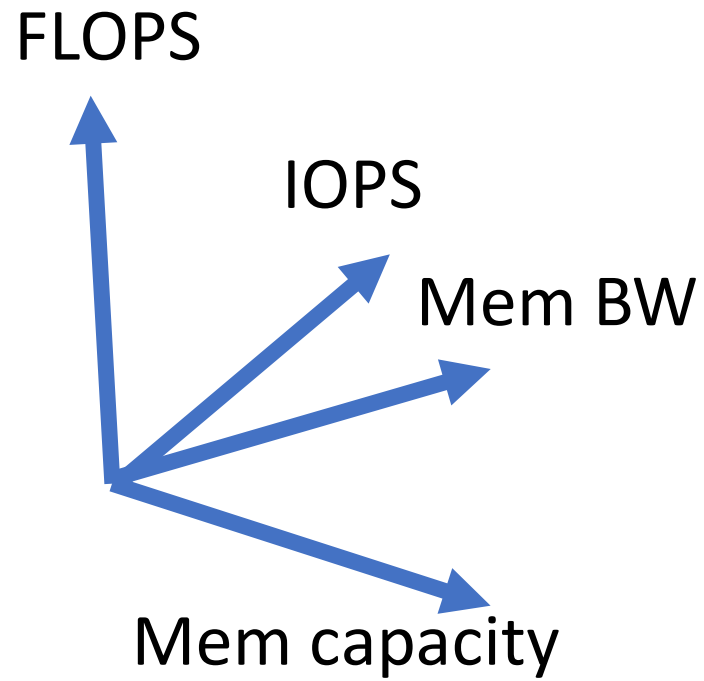
Test new node and **processor technologies** that will ultimately project to exascale

Mid 2018

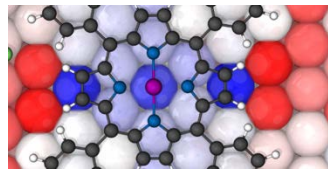
Early 2019

2020

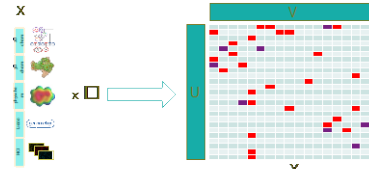
Deliver available performance to full-scale production applications



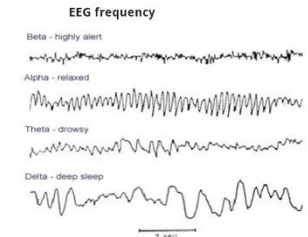
AVU-GSR



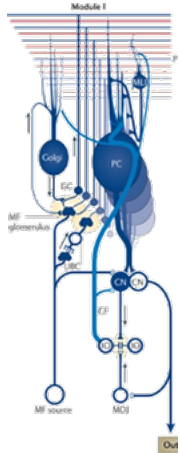
Quantum Espresso



SMURFF



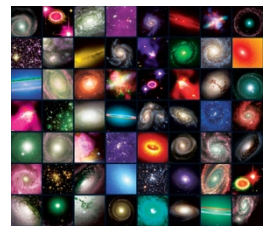
Neuromarketing



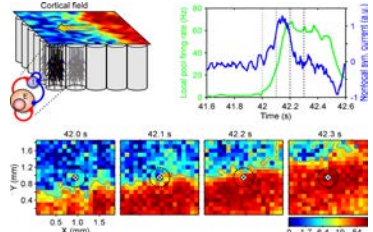
InfOli



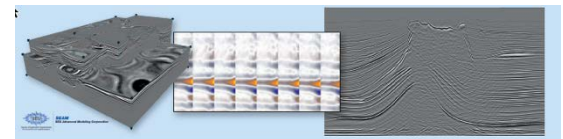
NEMO



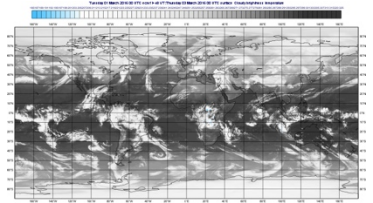
Astronomy image classification



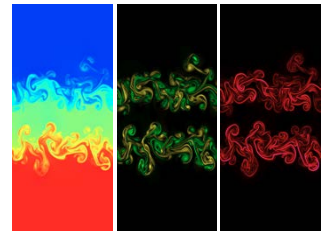
NEST/DPSNN



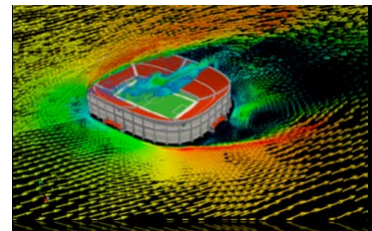
FRTM



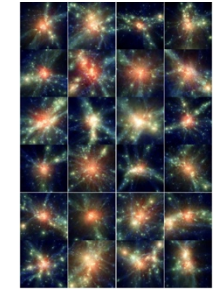
IFS



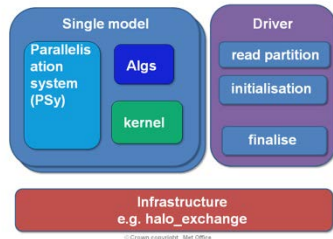
LBM



Alya



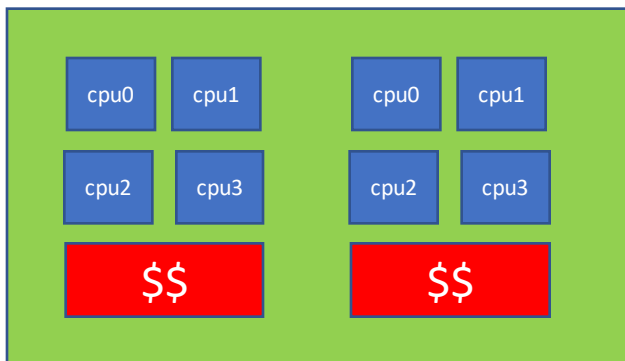
GADGET



LFRic

Co-design: Balance between compute resources and application demands

SoC cache sizes vs number of cores



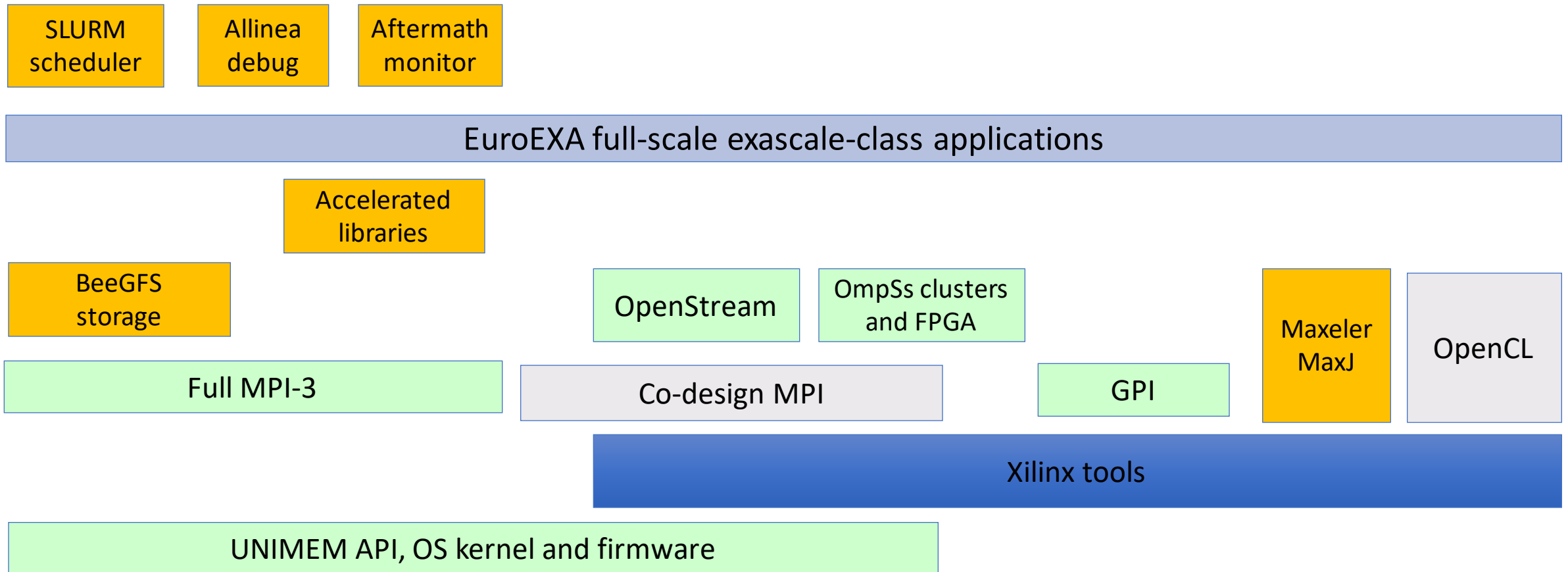
Xilinx Zynq UltraScale+ ZU9P for interconnect

Xilinx Zynq UltraScale+ VU9P for acceleration

ARM cores for control and non-accelerated code



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- Co-design and demonstrate 1 PF+ testbed in operational environment
- Vision is exascale machine for Europe

- High performance for full-scale production applications
- Co-design led to SoC design choices and change in FPGA
- Complete software stack and optimized portable programming models
- Ongoing porting of applications to the architecture

- For more information, visit the **BSC booth 2038**

Backup

- Co-design and demonstrate 1 PF+ testbed in operational environment
- Build on foundation from EUROSERVER, ExaNoDe, ExaNeSt, ECOSCALE projects
- Global address space (UNIMEM) and FPGA compute acceleration
- Deliver available performance to full-scale production applications
- Achieve balance between compute resources and demands of applications