



DEEP Projects



DEEP-EST

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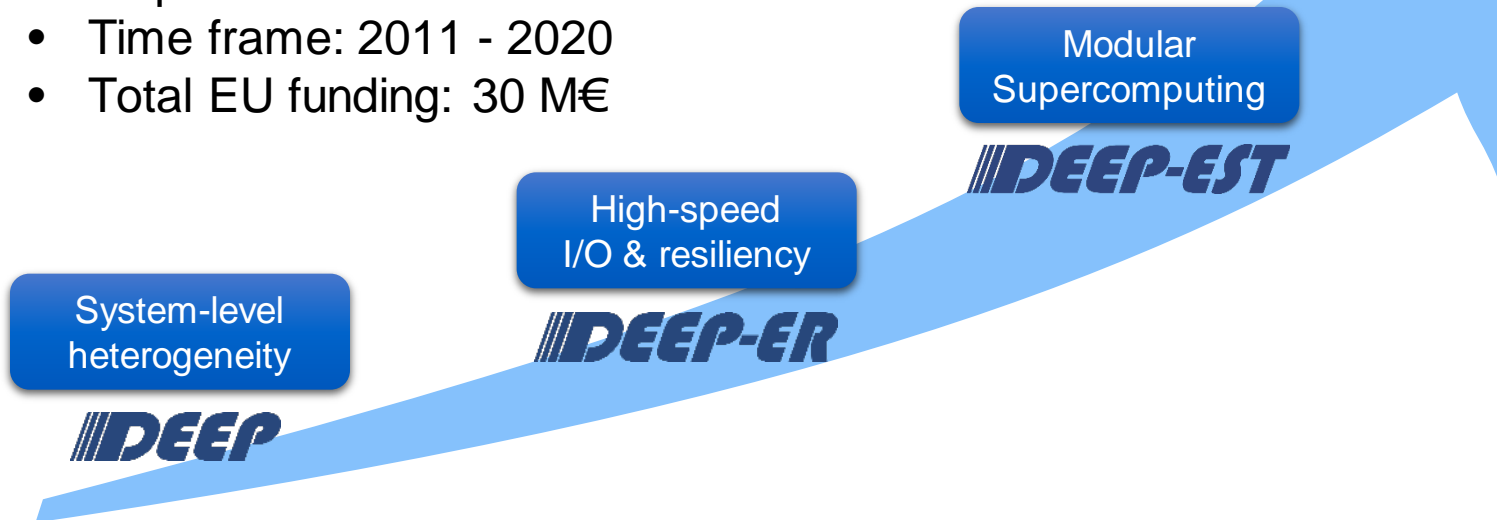
The DEEP Projects

Objectives

- Flexible association of heterogeneous resources
- Increase system performance & energy efficiency
- Address diverse application needs (HPC, HPDA, ML)
- Co-design production-quality HW & SW prototypes
- Build a strong, sustainable European ecosystem

Project data

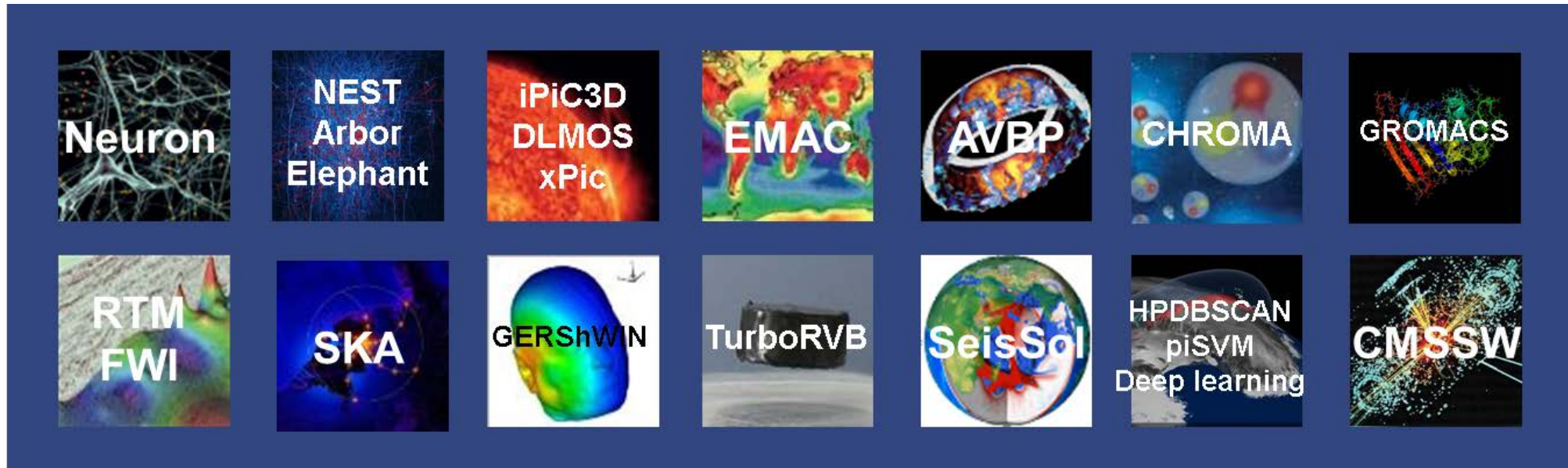
- 27 partners
- Time frame: 2011 - 2020
- Total EU funding: 30 M€



G. Oettinger @DEEP
EU Commissioner for Digital Economy and Society (2014-2017)



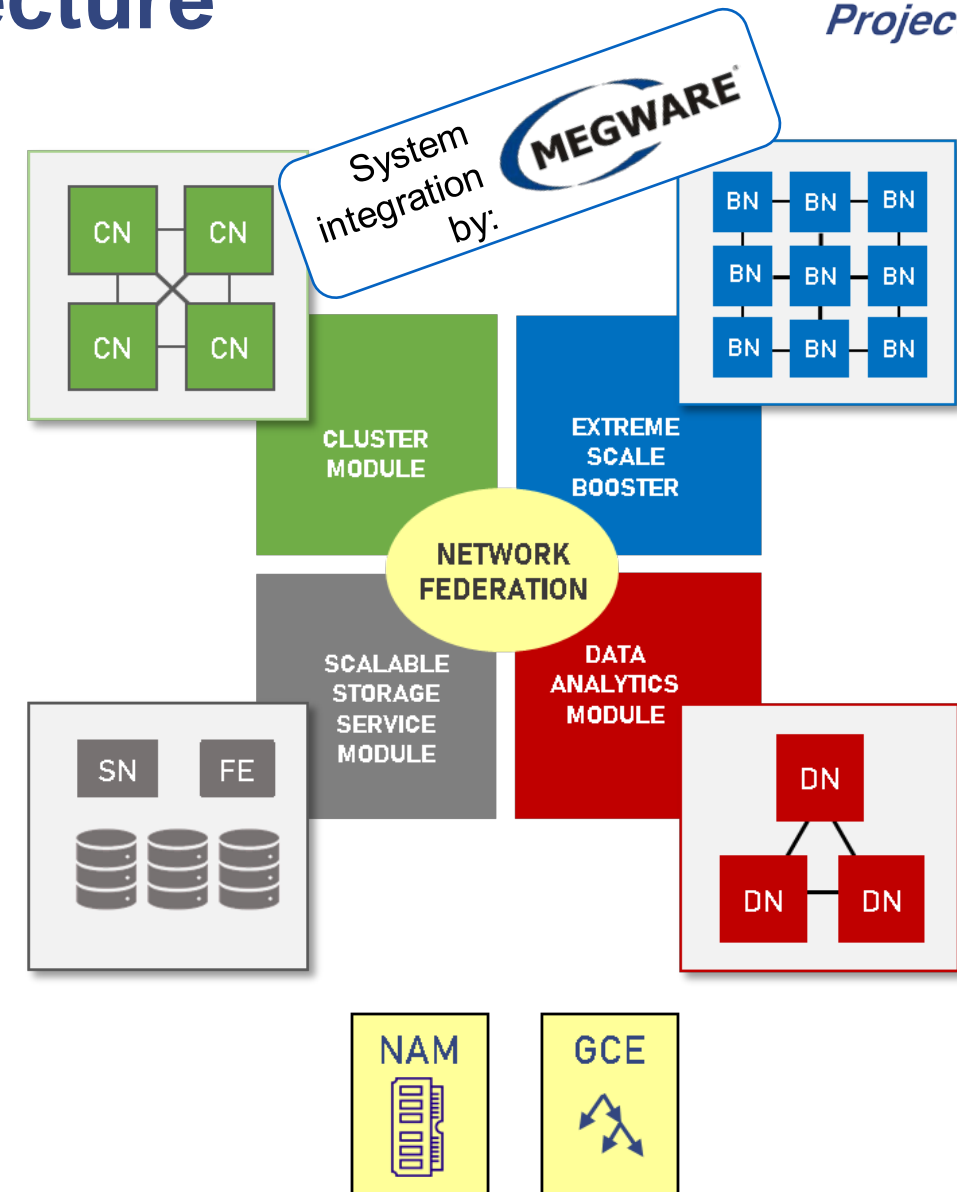
Co-design applications



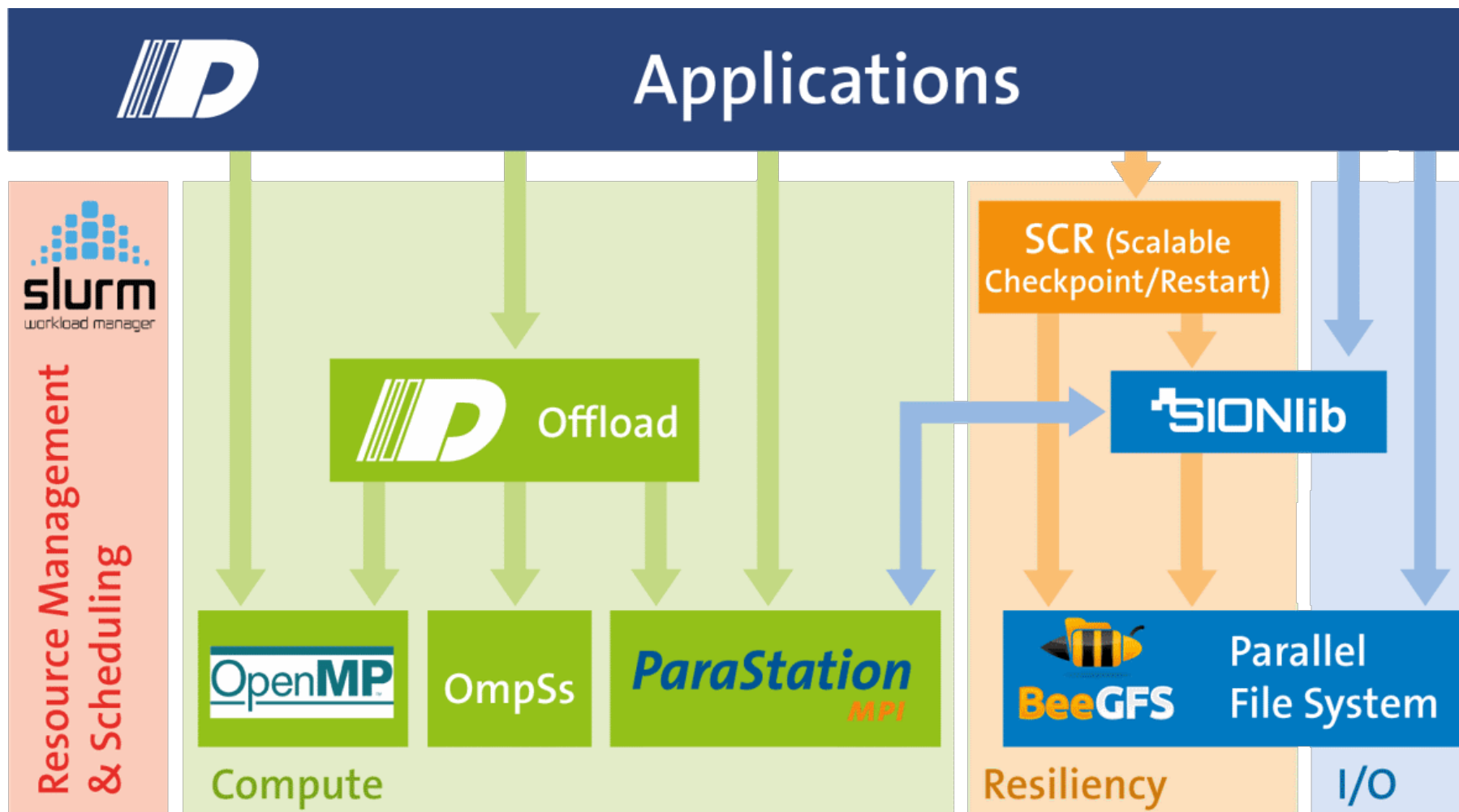
- **Kreuzer, et al.**, *Application Performance on a Cluster-Booster System. IPDPSW – HCW (2018)* [10.1109/IPDPSW.2018.00019]
- **Kreuzer et al.** *The DEEP-ER project: I/O and resiliency extensions for the Cluster-Booster architecture. HPC'18 proceedings*
- **Wolf et al.**, *PIC algorithms on DEEP: The iPiC3D case study. PARS-Mitteilungen 32, 38-48 (2015)*
- **Christou et al.**, *EMAC on DEEP, Geoscientific model devel.(2016)* [10.5194/gmd-9-3483-2016]
- **Kumbhar et al.**, *Leveraging a Cluster-Booster Architecture for Brain-Scale Simulations, Lecture Notes in Computer Science 9697 (2016)* [10.1007/978-3-319-41321-1_19]
- **Leger et al.**, *Adapting a Finite-Element Type Solver for Bioelectromagnetics to the DEEP-ER Platform. ParCo 2015, Advances in Parallel Computing, 27 (2016)* [10.3233/978-1-61499-621-7-349]

Modular Supercomputing Architecture

- Address **diverse user requirements** in one system
 - Data intensive
 - Highly scalable parallel computing
 - High throughput computing
- Modules shaped via **co-design**
- Achieve leading **scalability & energy efficiency**
 - Extreme Scale Booster → **Exascale**
- **Unified SW environment** to run applications across all modules



Software Environment



Goal: standard HPC environment supporting innovative architecture





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DEEP
Projects



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