



HPC in Cloud or Cloud in HPC: myths, misconceptions and misinformation

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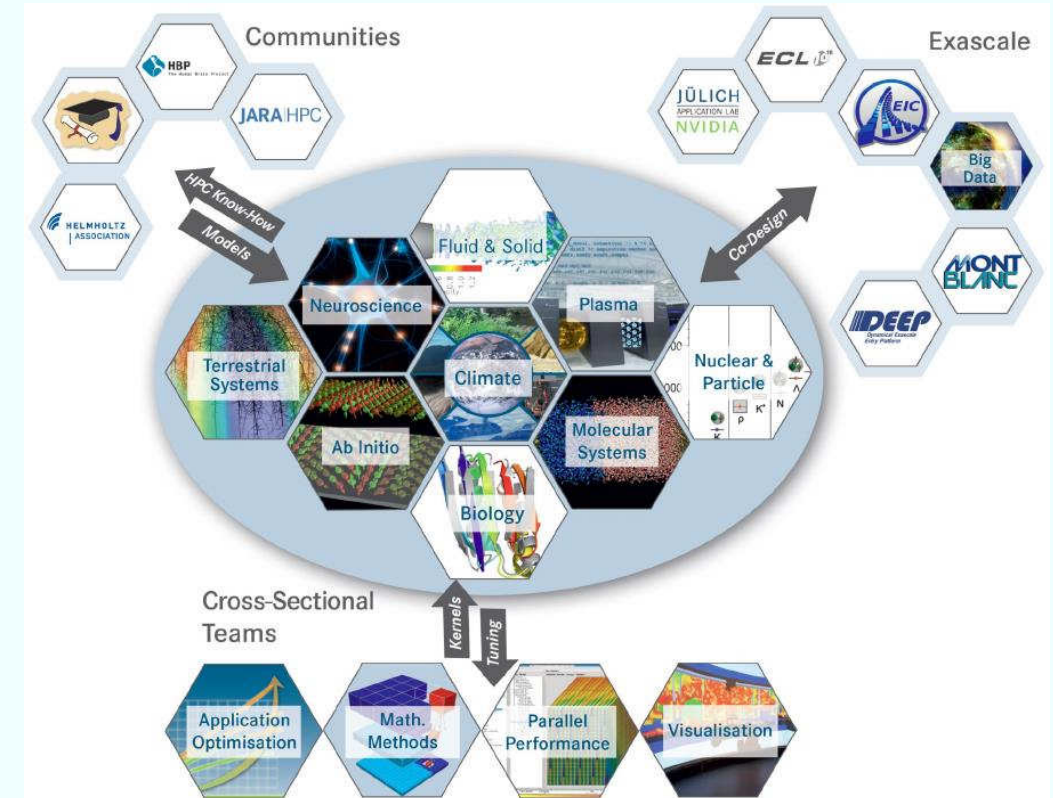
Introduction

- **Jülich Supercomputing Centre**

- Regional, national and European centre
- Education and training, application support
- Research and development
 - Computational science: SimLab
 - Algorithms, performance analysis and tools
 - HPC architectures and technologies: Exascale Laboratories
 - Community data management service

- **Role of research communities**

- Materials science
- Earth system modelling
- Brain research



“Convergence” of cloud and HPC or mutual enrichment?

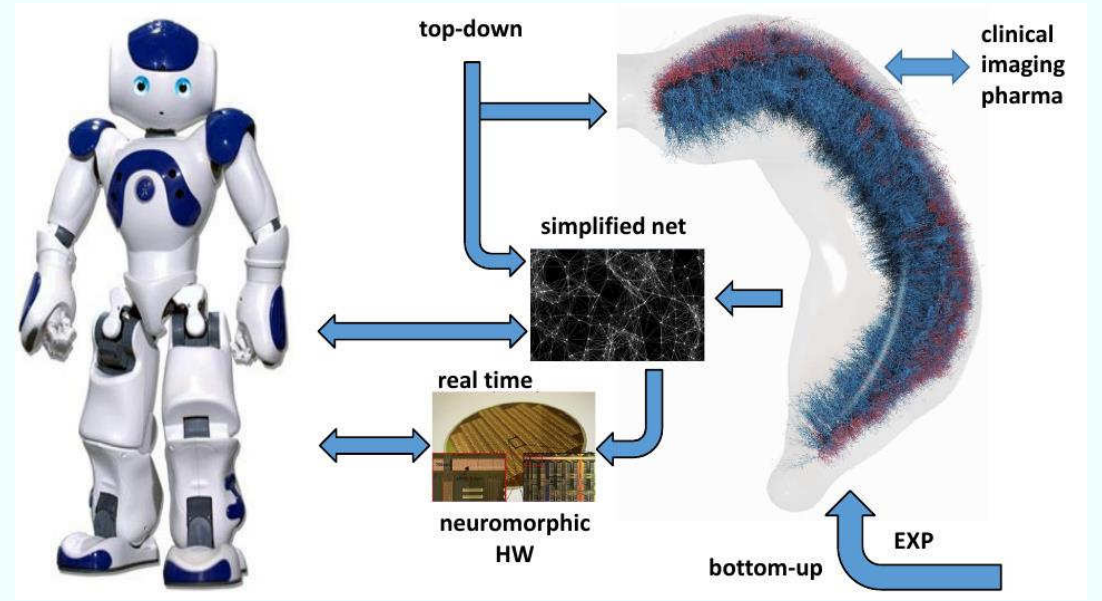
- **No convergence in the sense of an unavoidable process with known outcome**
 - Need for focus on benefits of mutual enrichment driven by willingness to enable changes in response of new opportunities and changing user needs
- **Awareness of differentiators**
 - Role of data locality and resource awareness
 - Security
 - Unique, complex works flows vs. consolidated solutions
 - Need for performance vs. benefits of elasticity
 - Role of virtualisation

Established Benefits of Mutual Enrichment

- **Scientific computing perspective**
 - Facilitate creation of science community specific platforms
 - Enable of new types of work flows
 - Support data curation and provenance tracking mechanisms
 - Facilitate collaborative research through federation of services
- **HPC centre perspective**
 - Consolidate and improve support of different research communities
 - Improve utilisation of resources
 - Opening towards new communities

Cloud and HPC: Opportunities for Enabling Research

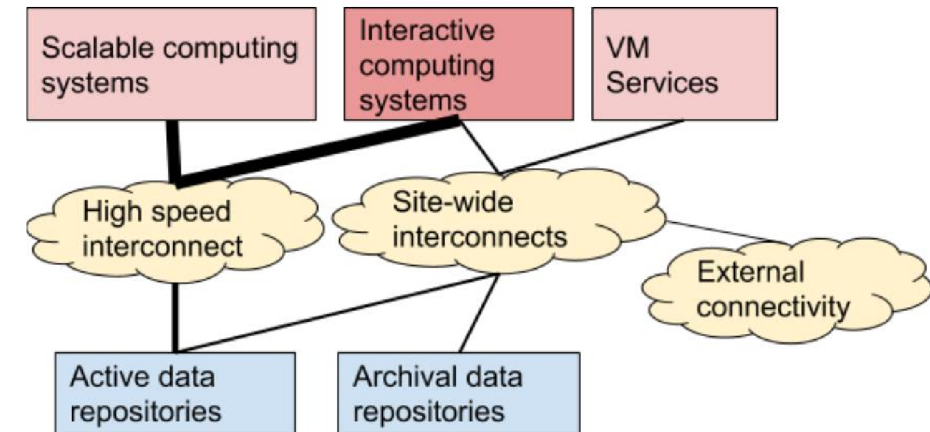
- **Example:**
Brain research community
- **Need to bring together**
 - Integration and sharing of data from diverse data sources
 - High-performance data analytics
 - High-performance computing for modelling
 - Coupling of different types of simulations
 - Support of interactive framework likes Jupyter notebooks
 - Integration of special purpose computers



[M. Migliore]

Example: Fenix

- **European project towards a federated provisioning of infrastructure services**
 - Partners today: BSC, CEA, CINECA, CSCS, JSC
 - Main science driver: Human Brain Project
- **Unified site architecture**
 - Different implementations
- **Key services**
 - Scalable compute, interactive compute, VM services
 - Active and archival data repositories
 - Data location, transfer and mover services
- **Integration in single AAI infrastructure**



Thank you