



Next Generation I/O for the Exascale

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I/O is the Exascale challenge

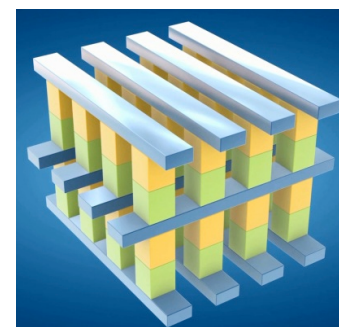


- Parallelism beyond 100 million threads demands a new approach to I/O
- Today's Petascale systems struggle with I/O
 - Inter-processor communication limits performance
 - Reading and writing data to parallel filesystems is a major bottleneck
- New technologies are needed
 - To improve inter-processor communication
 - To help us rethink data management and processing on capability systems

NEXTGenIO objectives



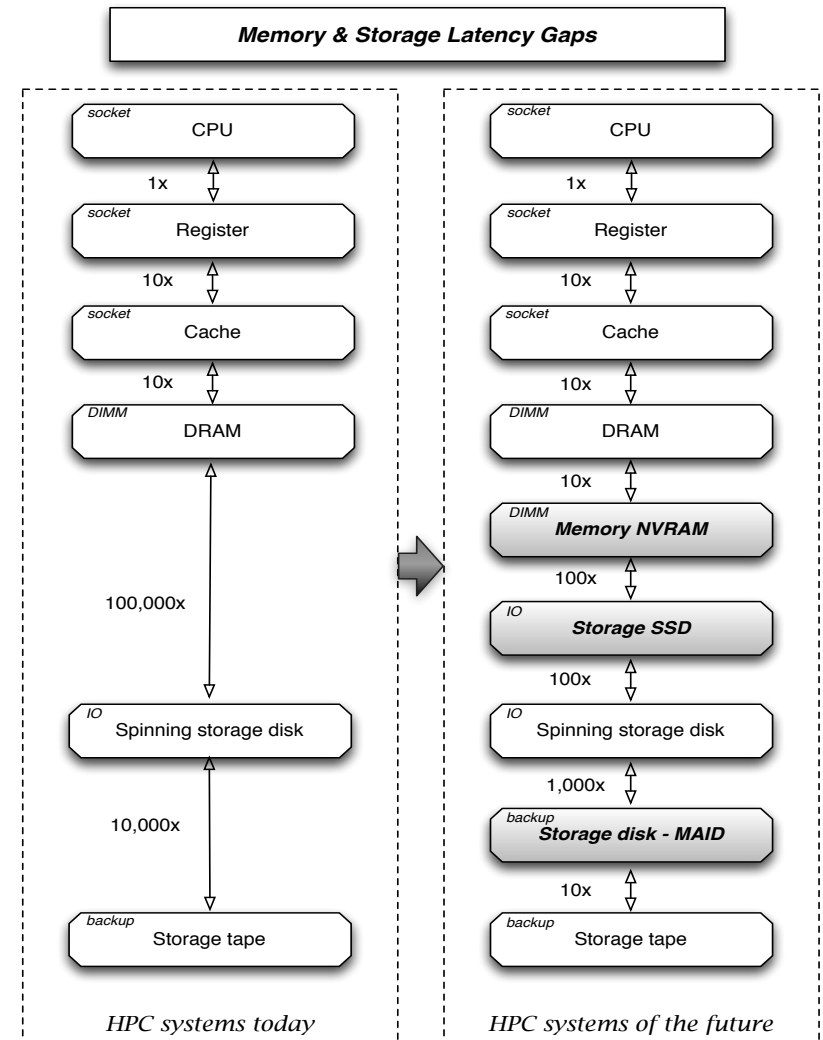
- Develop a new server architecture using next generation processor and memory advances
 - Based on Intel Xeon and 3D XPoint technologies
- Investigate the best ways of utilising these technologies in HPC
 - Develop the systemware to support their use at the Exascale
- Model three different I/O workloads and use this understanding in a co-design process
 - Representative of real HPC centre workloads



A new hierarchy



- Next generation NVRAM technologies will profoundly changing memory and storage hierarchies
- HPC systems and Data Intensive systems will merge
- Profound changes are coming to ALL Data Centres
- ... but in HPC we need to develop software – OS and application – to support their use



NEXTGenIO statistics



Project

- Research & Innovation Action
- 36 month duration
- €8.1 million
- Approx. 50% committed to hardware development
- Prototype system available from Month 27

Partners

- EPCC
- INTEL
- FUJITSU
- BSC
- TUD
- ALLINEA
- ECMWF
- ARCTUR

