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Towards Enabling Memory- and Data-Aware HPC

Tuesday, 25 September 2018 15:45 (30 minutes)

New memory and storage technologies create new opportunities for mitigating the growing gaps between memory and I/O performance on the one hand, and compute performance on the other hand. Efficient use of hierarchical or heterogeneous memory and storage architectures based on these new technologies can, however, be difficult and cumbersome. Programming models and run-time systems available today have limited capabilities to address this challenge. Typically focussed on improving the processing capabilities they often lack data-awareness. Without being memory-aware these software layers and tools are not able to manage data placement and transport. The newly started Maestro project, a research and development project funded by the European Commission, will address these short-comings by designing a memory- and data-aware middleware framework for high performance computing as well as high performance data analytics applications. The project relies on a co-design approach for which numerical weather prediction and climate reanalysis have been identified as a key application area for developing, validating and demonstrating the Maestro concepts.

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