

Séminaire Aristote "Quelles architectures pour les simulations de demain?"

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High level performance prediction following application characterization

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Designing a super computer to satisfy the needs of future applications and workloads within a given power envelope is not an easy task with the rapidly evolving high technology environment.

Performance prediction can be used for many different needs from designing a new micro architecture to a new memory hierarchy or even to define the interconnection and storages of the future.

Several tools exist for each of those different levels of details but it is usually difficult to mix them because of their different resolutions.

Based on a first approximation of the application behaviour mostly involving memory bandwidth and floating point demands we can demonstrate that realistic performance predictions can be easily obtained at the application level for single and multiple nodes configuration.

Starting from a standard characterization of the application, we show that such methodology can be a very useful tool to fulfil future needs with reasonable estimates. Same methodology can be applied to future implementation and future workloads as long as we have at least a prototype code.