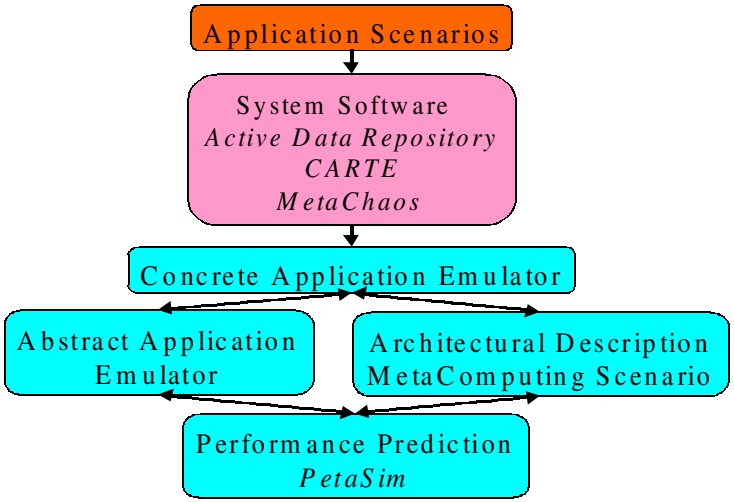
Performance Prediction and Modeling of Compute and Data Intensive Applications on Current and Future High Performance Architectures



New Ideas

- Application emulators for adaptive irregular and data intensive applications
- High level application modeling framework (HLAM) for describing applications, target machine and cost model for performance estimation
- Simulation framework to predict performance of application emulators using modeling framework (PetaSIM)

Impact

- Application emulators will be used to predict performance of leading edge applications on future high end computer architectures
- Application emulators, HLAM and PetaSIM will provide support for rapid prototyping of new architectures and systems software
- Provide rapid, coarse-grained performance estimates for petaflop-scale applications

Schedule

- Year 1 - Initial versions of 2 application emulators, and construction of first HLAM and PetaSIM prototypes
- Year 2 -Validation of application emulators, and initial performance predictions using HLAM/PetaSIM
- Year 3 - Extend application emulators and HLAM/PetaSim to multiple coupled applications on networks of multiprocessors

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