

Multi-level Steering in Distributed Laboratories

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Abstract

HPC end users in distributed computational laboratories interact via visual displays to solve problems collaboratively by manipulation of local, remote, and shared computational tools. In such settings, there may be substantial differences in the resources available to users, as exemplified by their use of high end visualization environments like CAVEs to low end environments more suitable for homes like browser-based visualizations. This poster depicts a concept called 'multi-level steering', where shared abstractions are used to integrate application-level steering by direct manipulation of program data with performance steering of system components. Research topics in multi-level steering include:

- policies for steering at specific levels, such as the dynamic adaptation of communication protocol stacks, runtime changes to shared objects like application pages or files, and changes to application-level objects,
- light-weight online steering, monitoring, and decision mechanisms offering explicit support for the construction and efficient execution of steering policies, within and across levels, including the filtering of online event data based on temporal conditions and the construction of time-based steering policies cognizant of policy interactions across levels.