
Software Development Tools for Petascale Computing Workshop

**1-2 August 2007
Washington, DC**

Organizing Committee:

Fred Johnson, DOE Office of Science

Thuc Hoang, National Nuclear Security Agency

Bronis de Supinski, Lawrence Livermore National Laboratory

Bart Miller, University of Wisconsin, Madison

Jeffrey Vetter, Oak Ridge National Laboratory

Workshop Goals

- ➔ The goal of the workshop is to identify and prioritize the opportunities and challenges for software development tools in preparation for the upcoming Petascale systems and their pioneering applications
- ➔ Specifically, we are planning to focus on
 - 1) development environments,
 - 2) performance tools,
 - 3) debugging tools, and
 - 4) infrastructures to support these tools

Workshop Final Report

The final report from this workshop will inform DOE management on the community's priorities for investments in software environments for FY08

- http://www.science.doe.gov/obp/FY_08_Budget/ASCR.pdf

➔ The final report begins with this workshop

Workshop Overview

➔ Applications

- Brian Pudliner, LLNL
- Robert Harrison, ORNL
- John Daly, LANL

➔ Platforms

- Fred Johnson
- Bob Meisner

➔ Tools retrospective and future

- Bart Miller

➔ Poster session immediately following lunch

- ~20 posters

Working Groups

- ➔ Performance tools (Dan Reed, Bernd Mohr)
 - Analysis, modeling, optimization, interactive, automatic, data management, instrumentation, hardware and operating system support, visualization, etc
- ➔ Correctness and Debugging tools (Curtis Janssen, Susan Coghlan)
 - Code correctness, instrumentation, memory, threading, MPI, automatic, interactive, visualization, hardware and operating system support, etc.

- ➔ Scalable infrastructures (Jeff Hollingsworth, Al Geist)
 - Infrastructures for tool communication, data management, tracing, profiling, etc
- ➔ Development environment infrastructures (Rod Oldehoeft, Craig Rasmussen)
 - Integrated development environments, build environments (e.g., make, libtool), compiler support for development environments, mixed language support, refactoring, automatic interface generation and validation, testing, source code control

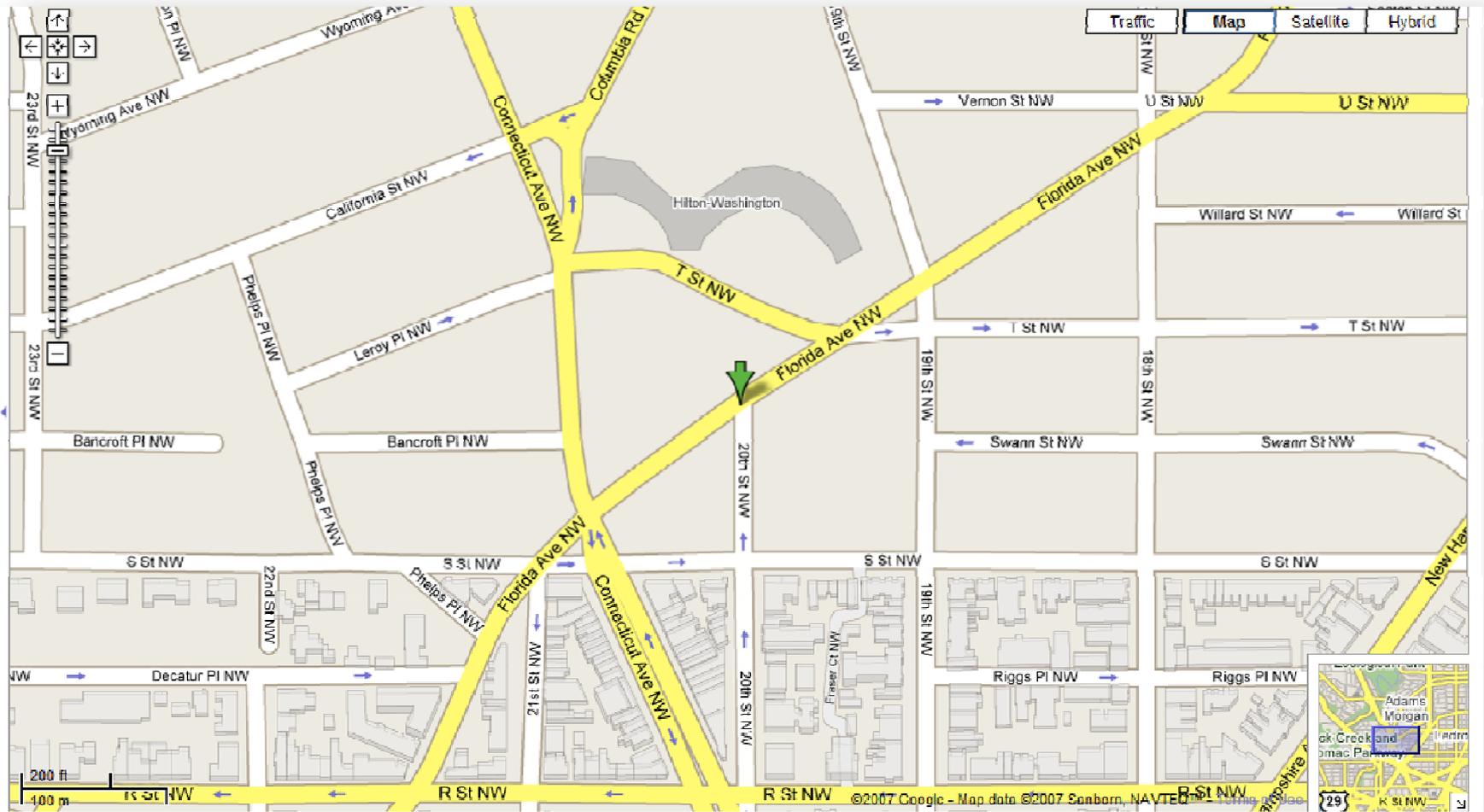
Working Group Deliverables

- ➔ Current Status
- ➔ Petascale Requirements
- ➔ Findings
- ➔ Recommendations
 - Ordered List of Priorities
 - Type of Challenge
 - Technical
 - Funding
 - Policy
 - Training
 - Impact
 - High, medium, low
 - Probability
 - High, medium, low
- ➔ You have ~3 hours
- ➔ Participate
- ➔ WG chairs have been asked to keep the conversations on track
 - Don't be offended
- ➔ Divide and conquer if necessary
- ➔ Don't try to solve the technical problems per se

Example

#	Challenge	Type	Probability	Impact
N	Detecting scale-variant code errors	Technical	High	High
N+1	...			
N+2	Syntax highlighting editor	Funding	Low	Low

Lunches and Dinners



Dozens of restaurants in just a few blocks. See materials at registration desk.

From the organizing committee...

**Thanks for your
help on this
important endeavor**