

Workshop on Performance Technology

Middleware/Systems Software
Breakout Group

High-Level Observations

- Programming models
 - ◆ huge diversity
 - ◆ obstacle to performance modeling
 - We are surrounded by opportunities
 - ◆ programming models
 - ◆ platforms and networks
 - ◆ parallel/distributed codes
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Nuts and Bolts: Short-Term Challenges and Opportunities

- Standard task graph representations
 - ◆ define our words
 - ◆ allow sharing of task graphs across projects
 - ◆ enable greater tool integration
 - Standard representations
 - ◆ performance data
 - ◆ models of dynamically configured systems
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Nuts and Bolts (Continued)

- APIs
 - ◆ application to performance tools
 - ◆ others not yet fully defined
 - NT systems
 - ◆ porting tools to the NT environment
 - ◆ modeling of NT clusters and networks
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Research Problems

- Trend analysis and error bounds
 - ◆ defining the envelope of variability for applications and machine types
 - ◆ performance sensitivity
 - system/application parameters
 - model abstraction
 - ◆ parameter studies and automated sensitivity analysis techniques
 - Environmental variability
 - ◆ performance analysis
 - ◆ relationship to quality of service
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Research Problems

- Compositional performance models
 - ◆ including error bounds
 - Analysis of adaptive computations
 - ◆ information/data types required
 - Demands of future applications
 - ◆ computational grids, data intensive
 - ◆ hard real-time, and highly irregular
 - ◆ smart rooms, MEMS, and FPGAs
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