

Power-Aware Computing

MEGRSCRLE

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Overview of SCIMA

Network

800 MHz

Profile

Power, Time

Performance/Power Optimization for SCIMA

Advantage of SCIMA: Software Controlled Integrated Memory Architecture

Performance Improvement

- full exploitation of data locality without cache pollution
- flexible granularity of data transfers to/from off-chip memory
- **-** Dynamic Power Reduction
 - reduced off-chip access
- **Static Power Reduction**
 - identification and Vdd gating of unnecessary on-chip memory area



Power-Aware Computing in a PC Cluster by DVS

Profiled-based optimization of power-performance for DVS-enabled clusters

- Recentry, energy has become an important issue in high performance computing.
- Modern high performance processors for cluster computing have Dynamic Volatage Scaling (DVS), which may reduce the power consumption by changing clock frequency-voltage setting without impacting time-to-solution.
- We investigate a method of power-



performance optimization by DVS based on both power and execution profiles of parallel program in a PC cluster.

Experimental results

- Turion low power cluster Processor = Turion MT-34 1.8GHz # of nodes = 8
- Memory = 1GB/proc = Gigabit Ethernet Network 20%+ reduction in terms of EDP in NPB IS and FT.

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