DESCRIPTION

The state of the art of high-performance computing

Prominent researchers from around the world have gathered to present the state-of-the-art techniques and innovations in high-performance computing (HPC), including:

* Programming models for parallel computing: graph-oriented programming (GOP), OpenMP, the stages and transformation (SAT) approach, the bulk-synchronous parallel (BSP) model, Message Passing Interface (MPI), and Cilk

* Architectural and system support, featuring the code tiling compiler technique, the MigThread application-level migration and checkpointing package, the new prefetching scheme of atomicity, a new "receiver makes right" data conversion method, and lessons learned from applying reconfigurable computing to HPC

* Scheduling and resource management issues with heterogeneous systems, bus saturation effects on SMPs, genetic algorithms for distributed computing, and novel task-scheduling algorithms

* Clusters and grid computing: design requirements, grid middleware, distributed virtual machines, data grid services and performance-boosting techniques, security issues, and open issues

* Peer-to-peer computing (P2P) including the proposed search mechanism of hybrid periodical flooding (HPF) and routing protocols for improved routing performance
* Wireless and mobile computing, featuring discussions of implementing the Gateway Location Register (GLR) concept in 3G cellular networks, maximizing network longevity, and comparisons of QoS-aware scatternet scheduling algorithms

* High-performance applications including partitioners, running Bag-of-Tasks applications on grids, using low-cost clusters to meet high-demand applications, and advanced convergent architectures and protocols

High-Performance Computing: Paradigm and Infrastructure is an invaluable compendium for engineers, IT professionals, and researchers and students of computer science and applied mathematics.

**ABOUT THE AUTHOR**

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