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Titolo	High-performance computing [[electronic resource]] : paradigm and infrastructure / / edited by Laurence T. Yang, Minyi Guo
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Descrizione fisica	1 online resource (818 p.)
Collana	Wiley series on parallel and distributed computing
Altri autori (Persone)	YangLaurence Tianruo GuoMinyi
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Soggetti	High performance computing Parallel processing (Electronic computers) Electronic data processing - Distributed processing
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	HIGH-PERFORMANCE COMPUTING; Contents; Preface; Contributors; PART 1 Programming Model; 1 ClusterGOP: A High-Level Programming Environment for Clusters; 1.1 Introduction; 1.2 GOP Model and ClusterGOP Architecture; 1.2.1 The ClusterGOP Architecture; 1.3 VisualGOP; 1.4 The ClusterGOP Library; 1.5 MPMD programming Support; 1.6 Programming Using ClusterGOP; 1.6.1 Support for Program Development; 1.6.2 Performance of ClusterGOP; 1.7 Summary; 2 The Challenge of Providing A High-Level Programming Model for High-Performance Computing; 2.1 Introduction; 2.2 HPC Architectures 2.2.1 Early Parallel Processing Platforms2.2.2 Current HPC Systems; 2.3 HPC Programming Models: The First Generation; 2.3.1 The Message Passing Interface (MPI); 2.3.2 High Performance Fortran (HPF); 2.4 The Second Generation of HPC Programming Models; 2.4.1 OpenMP; 2.4.2 Other Shared-Memory APIs; 2.4.3 Is A Standard High-Level API for HPC in Sight?; 2.5 OpenMP for DMPs; 2.5.1 A Basic Translation to GA; 2.5.2

Implementing Sequential Regions; 2.5.3 Data and Work Distribution in GA; 2.5.4 Irregular Computation Example; 2.6 Experiments with OpenMP on DMPs; 2.7 Conclusions
3 SAT: Toward Structured Parallelism Using Skeletons3.1 Introduction; 3.2 SAT: A Methodology Outline; 3.2.1 Motivation and Methodology; 3.2.2 Abstraction View: Basic Skeletons and Compositions; 3.2.3 Performance View: Collective Operations; 3.2.4 SAT: Combining Abstraction with Performance; 3.3 Skeletons and Collective Operations; 3.3.1 The H Skeleton and Its Standard Implementation; 3.3.2 Transformations for Performance View; 3.4 Case Study: Maximum Segment SUM (MSS); 3.5 Performance Aspect in SAT; 3.5.1 Performance Predictability; 3.5.2 Absolute Performance; 3.6 Conclusions and Related Work
4 Bulk-Synchronous Parallelism: An Emerging Paradigm of High-Performance Computing4.1 The BSP Model; 4.1.2 BSP Versus Traditional Parallelism; 4.1.3 Memory Efficiency; 4.1.4 Memory Management; 4.1.5 Heterogeneity; 4.1.6 Subset Synchronization; 4.1.7 Other Variants of BSP; 4.2 BSP Programming; 4.2.1 The BSPlib Standard; 4.2.2 Beyond BSPlib; 4.3 Conclusions; 5 Cilk Versus MPI: Comparing Two Parallel Programming Styles on Heterogeneous Systems; 5.1 Introduction; 5.1.1 Message-Passing Run-Time Systems; 5.1.2 Cilk's Dataflow Model; 5.1.3 Terminology; 5.2 Experiments; 5.2.1 Programs; 5.2.2 Test Bed
5.3 Results5.3.1 Fibonacci; 5.3.2 Traveling Salesman Problem; 5.3.3 N-Queens Problem; 5.3.4 Matrix Multiplication; 5.3.5 Finite Differencing; 5.3.6 Program Complexity; 5.4 Conclusion; 6 Nested Parallelism and Pipelining in OpenMP; 6.1 Introduction; 6.2 OpenMP Extensions for Nested Parallelism; 6.2.1 Parallelism Definition; 6.2.2 Thread Groups; 6.2.3 Evaluation of the Proposal; 6.3 OpenMP Extensions For Thread Synchronization; 6.3.1 Precedence Relations; 6.3.2 Evaluation of the Proposal; 6.4 Summary; 7 OpenMP for Chip Multiprocessors; 7.1 Introduction; 7.2 3SoC Architecture Overview
7.2.1 Quads

Sommario/riassunto

The state of the art of high-performance computingProminent 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, th

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Sommario/riassunto	The notion of software as a service promises agile, flexible and low maintenance system development through a dynamic runtime architecture that allows third-party functionality and capability to be added on demand. There is growing research interest in how service-orientation can be adopted a means for enhancing agility and flexibility in product line engineering. However, integrating service-orientation in product line engineering poses a number of challenges. These include difficulty in identifying services, ensuring services reflect user needs, and determining configurations of services that are relevant in different user contexts. This paper describes an approach for service- oriented product line development that integrates feature-oriented engineering with a self-managing consumer-centred negotiation process to address these challenges.