Fatos Xhafa Ajith Abraham (Eds.)

Metaheuristics for Scheduling in Distributed Computing Environments

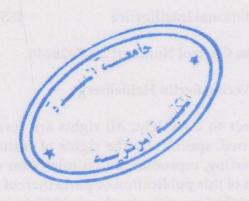


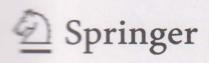
Springer

Fatos Xhafa Ajith Abraham (Eds.)



## Metaheuristics for Scheduling in Distributed Computing Environments





## Contents

1 Meta-heuristics for Grid Scheduling Problems Fatos Xhafa, Ajith Abraham	1
2 Optimizing Routing and Backlogs for Job Flows in a Distributed Computing Environment David Montana, John Zinky	39
Robust Allocation and Scheduling Heuristics for Dynamic, Distributed Real-Time Systems Dazhang Gu, Lonnie Welch	61
4 Supercomputer Scheduling with Combined Evolutionary Techniques 4 LaTorre, J.M. Peña, V. Robles, P. de Miguel	95
5 Adapting Iterative-Improvement Heuristics for Scheduling File-Sharing Tasks on Heterogeneous Platforms Kamer Kaya, Bora Uçar, Cevdet Aykanat	121
Advanced Job Scheduler Based on Markov Availability Model and Resource Selection in Desktop Grid Computing Environment	
Eun Joung Byun, Sung Jin Choi, Hong Soo Kim, Chong Sun Hwang, Sung Keun Lee	153
Workflow Scheduling Algorithms for Grid Computing Yu, Rajkumar Buyya, Kotagiri Ramamohanarao	173
Decentralized Grid Scheduling Using Genetic Algorithms  George Iordache, Marcela Boboila, Florin Pop, Corina Stratan,	
Valentin Cristea	215

Single and Multisobjective Optimization Appareign

9 Nature Inspired Meta-heuristics for Grid Scheduling: Single and Multi-objective Optimization Approaches Ajith Abraham, Hongbo Liu, Crina Grosan, Fatos Xhafa	247
10 Efficient Batch Job Scheduling in Grids Using Cellular Memetic Algorithms Fatos Xhafa, Enrique Alba, Bernabé Dorronsoro, Bernat Duran, Ajith Abraham.	273
11 P2P B&B and GA for the Flow-Shop Scheduling Problem A. Bendjoudi, S. Guerdah, M. Mansoura, N. Melab, EG. Talbi	301
12 Peer-to-Peer Neighbor Selection Using Single and Multi-objective Population-Based Meta-heuristics  Hongbo Liu, Ajith Abraham, Fatos Xhafa	323
13 An Adaptive Co-ordinate Based Scheduling Mechanism for Grid Resource Management with Resource Availabilities B.T. Benjamin Khoo, Bharadwaj Veeravalli	341
Index	361
Author Index	

The series Studies in Computational Intelligence (SCI) publishes new developments and advances in the various areas of computational intelligence – quickly and with a high quality. The intent is to cover the theory, applications, and design methods of computational intelligence, as embedded in the fields of engineering, computer science, physics and life science, as well as the methodologies behind them.

The series contains monographs, lecture notes and edited volumes in computational intelligence spanning the areas of neural networks, connectionist systems, genetic algorithms, evolutionary computation, artificial intelligence, cellular automata, self-organizing systems, soft computing, fuzzy systems and hybrid intelligent systems. Critical to both contributors and readers are the short publication time and world-wide distribution – this permits a rapid and broad dissemination of research results.

Grid computing has emerged as one of the most promising computing paradigms of the new millennium! Achieving high performance Grid computing requires techniques to efficiently and adaptively allocate jobs and applications to available resources in a large scale, highly heterogenous and dynamic environment.

This volume presents meta-heuristics approaches for Grid scheduling problems. Due to the complex nature of the problem, meta-heuristics are primary techniques for the design and implementation of efficient Grid schedulers. The volume brings new ideas, analysis, implementations and evaluation of meta-heuristic techniques for Grid scheduling, which make this volume novel in several aspects. The 14 chapters of this volume have identified several important formulations of the problem, which we believe will serve as a reference for the researchers in the Grid computing community. Important features include the detailed overview of the various novel metaheuristic scheduling approaches, excellent coverage of timely, advanced scheduling topics, state-of-the-art theoretical research and application developments and chapters authored by pioneers in the field. Academics, scientists as well as engineers engaged in research, development and scheduling will find the comprehensive coverage of this book invaluable.

ISSN 1860-949X



Available online springerlink.com



springer.com