

# Preface

Grid Computing was a vision of using and sharing computers and data in the early 1990s. The integration, coordination, and sharing of computer resources which are geographically disperse among different physical domains and organizations became an every day reality. This emerging infrastructure aims to provide a mechanism for sharing and coordinating the use of heterogeneous computing resources.

The term “Grid” is used as an analogy with the electric power grid, which provides pervasive access to electricity. Grid Computing has its roots in e-Science and has evolved from parallel, distributed, and high-performance computing. Grid Computing is a dominating technology that has undoubtedly changed the landscape of computer science. During these years, Grid Computing achieved to overcome every obstacle and challenge, and comprised an incontrovertible paradigm for future computer networks.

Up to now, this new evolving technology achieved to provide to its users the ability to utilize at maximum the existing resources across a network. Grid Computing takes collective advantage of the vast improvements that have occurred over the last few years, in microprocessor speeds, optical communications, storage capacity, the World Wide Web, and the Internet. A set of standards and protocols are being developed that completely disaggregate current compute platforms and distribute them across a network as resources that can be called into action by any eligible user or machine at any time.

The continuous progress in scientific research demanded for computational power leading to more and more powerful computer platforms in order to be able to solve high-resource demanding scientific problems. Many research projects and varied applications such as astrophysics, biology, chemistry, drug discovery, ecological modeling, mathematics, operations research, physics, and complex simulations are now driven by Grid Computing.

The explosive growth of computer science influenced the Information Technologies (IT) departments which have a vital role in shaping and conducting businesses orientation. The organizations focused on a more efficient utilization of their IT resources leveraging competition through a flexible and cost-effective infrastructure that fosters innovation and collaboration.

Consequently, tremendous capabilities and capacities that Grid Computing offers attracted the interest of academics, researchers, scientific communities, and computer industry around the world. Nevertheless, the question for the grid technology still remains. Grid Computing will become something like the Electric Grid of the twenty-first century.

The book structure brings together many of the major projects that aim to an emerging global Grid infrastructure. The present book aims to explore practical advantages and emphasize on developed applications for Grid Computing.

The contents of this book have purposely been selected and compiled with a reader focus in mind, in order to provide a comprehensible and useful knowledge for different readers with different needs. Through the presented practical approaches containing loads of information which came from real cases, this book aims to enable the reader an in-depth study of Grid technology. Thus, the primary target group of this book is academics, researchers, and graduates. Our purpose is to provide them with insights that can serve as a basis for further research on Grid Computing.

As a secondary target audience, the book focuses on industry and potential buyers of Grid solutions. Another aim of the book is to provide industries and IT department heads with a thorough understanding of how businesses can benefit from Grid Computing in order to motivate them to adopt Grid solutions in their enterprises. Also, system designers, programmers, and IT policy makers will learn about new applications and the book may serve them as a useful reference book. Also, systems designers, programmers, and IT policy makers will learn about new applications finding in the book a useful reference guide.

Thus, this book has a wide-ranging scope while it appeals to people with various computer abilities. It is written for readers with an extensive computing background, providing them an easy-to-follow path through extensive analysis and paradigms about the various Grid systems that are available today. Therefore, it will be a useful tool for researchers and professionals as it aims to help them understand and use Grid systems for scientific and commercial purposes.

The book received 153 chapter submissions and each chapter submission was peer-reviewed by at least two experts and independent reviewers. As a result, 27 chapter submissions were accepted, with an acceptance rate 17.6%. In this book 12 chapters out of 27 are contained which are divided into four parts: (I) E-Science, Applications, and Optimization; (II) Resource Management, Allocation, and Monitoring; (III) Grid Services and Middleware; and (IV) Grid Computing for Scientific Problems.

I hope that the reader will share my excitement and will find this book informative and useful in motivating him to get involved in this magnificent scientific field.

School of Electrical and Computer Engineering,  
National Technical University of Athens,  
Athens, Greece

Nikolaos P. Preve



<http://www.springer.com/978-0-85729-675-7>

Grid Computing

Towards a Global Interconnected Infrastructure

Preve, N.P. (Ed.)

2011, XVI, 312 p., Hardcover

ISBN: 978-0-85729-675-7