Book Reviews

The Grid from the Ground Up

Art Sedighi • DataSynapse

Grid Computing: Software Environments and Tools
Jose C. Cunha and Omer F. Rana, eds.
332 pages
US$99.00
Springer, 2005

Working in Grid computing, I know how hard it is to find a text that covers the software engineering aspects of the Grid without heavy math and chapters of theory upon theory. There’s nothing wrong with Grid computing theory, but after reading the basics, you need to actually architect and build your Grid applications. Grid Computing: Software Environments and Tools is the first book that covers Grid computing from the architects’ perspective—and does so in a practical manner.

This book aims to demonstrate and teach the difficult software engineering aspects of Grid computing. Grid-enabling an application is unlike any other methodology because it requires intimate knowledge of the underlying infrastructure (network, operating system, memory, and so on), along with in-depth knowledge of the application that you’re Grid-enabling. Most modeling techniques, software engineering tools, or methodologies don’t require you to think of everything all together. We’re used to developing applications to fit a specific need, engineering the network, purchasing as many boxes as we think the application will need, and putting them all together. This approach will lead only to failure because all these parts must work in conjunction for you to have a successful deployment and happy end users.

The book primarily targets Grid application developers. The authors focus on what they call “deployment specialists”—the folks in charge of setting up the Grid infrastructure and ensuring that applications execute properly. Modeling Grid applications hasn’t been done before as comprehensively as in this book. This book focuses on this aspect of software engineering and explores how to ensure common understanding of the Grid across an organization. This “conceptual Grid” paints a picture for developers and managers alike that uses

- tools, languages, and support structure common to the infrastructure and
- concepts from object orientation, design patterns, UML (Unified Modeling Language), and so on.

Much of the book focuses on monitoring aspects of Grid computing. The authors realize that, as you would expect, monitoring a large deployment of services and infrastructure is difficult. They emphasize monitoring and maintaining the Grid by using Web portals, with the basic portal to what the authors call a third-generation Web portal or the Semantic Grid. The Semantic Grid concept essentially promotes a service-oriented view by using Web services technology. By adding semantic meanings to the Grid, you can do such things as orchestrate services and workflow on the Grid.

The book’s second half presents case studies for topics including modeling, applying design patterns, workflows, and building a Grid portal. The first case studies illustrate simple applications such as job
scheduling and orchestration using a GUI interface developed by Fraunhofer IGD, then move on to more complicated things such as developing a search engine that uses semantics to mark up documents and ensure good results. The case studies go beyond developing an application—for instance, showing how to monitor large Grids and demonstrating third-party tools that assist in the everyday maintenance of a Grid infrastructure.

*Grid Computing: Software Environments and Tools* offers a practical approach to Grid computing and its software engineering aspects. The authors take you through the process of building a Grid from the ground up, including software architecture, infrastructure, development, deployment, monitoring, and upgrades. I highly recommend this text to anyone interested in Grid computing or software development for the Grid environment.

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