Book Reviews

Networks' Importance in Grids

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*Grid Networks*
By Franco Travostino, Joe Mambretti, and Gigi Karmous-Edwards, eds.
372 pages
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Grid computing is a result of the movement from supercomputers and clusters towards truly distributed means for complex computing tasks and related data storage. Although computing and storage resources are of prime interest to the Grid community, one important resource is often overlooked: networks. This is strange because the Grid’s distributed architecture couldn’t exist without a high-speed, reliable networking infrastructure. Moreover, this attitude is unfortunate because networks and connections should be fully available for Grid applications’ dynamic choice. The explanation of this approach could be that the core Grid community is very applications oriented, concentrating more on software and middleware and simply relying on the existing communications infrastructure.

The networking infrastructure, however, isn’t fast, reliable, and available just by chance. Grids can (and do) leverage all of today’s networking advancements. But grids require more than the vast majority of common data networks. *Grid Networks*, edited by Franco Travostino, Joe Mambretti, and Gigi Karmous-Edwards, explains what requirements are imposed on Grid networks and what technologies will enable the creation of an efficient Grid infrastructure.

Systematic approach

This book includes 15 chapters and an appendix. Although different authors wrote each chapter, the text is logically arranged. The authors cover a breadth of topics and recent research, including both theoretical concepts and empirical results. The book introduces Grid technologies, analyzes distinguishing use cases and architectural attributes, and discusses emerging standards. It discusses Grid network services in depth in relation to Grid network requirements and driver applications presentation. Multiservice networks are a must for efficient Grid computing, but mapping applications requirements onto such networks might not be easy. The book discusses quality-of-service issues from both Grid and network perspectives.

Because grids utilize the TCP/IP stack, the book shows the enhancements to core Internet protocols that best serve Grid requirements. It then concentrates on the bottom three layers of networking architecture with respect to what services they offer and what technologies they deploy. The book covers all recent technologies and approaches, such as MPLS (multiprotocol label switching), VPLS (virtual private LAN service), and OBS (optical burst/packet switching), as well as network performance monitoring and reliability (fault detection, recovery, and restoration). It closes with technological advancements that could be important for future Grid networks (including wireless and access networks and photonic integrated circuits). An appendix provides an overview of experimental research testbeds and prototype implementations, such as GLIF (Global Lambda Integrated Facility), GENI (Global Environment for Network Innovations), and GEANT2.
Not only for networkers

This book fills a hole in the market and bridges the gap between the network and Grid communities. It provides a necessary discussion of a core Grid component; without networks, there would be no Grid. The subtitle puts it well: *Enabling grids with advanced communication technology*. The book covers grid networks’ potential and presents work in progress. Plenty of research initiatives and projects deal with networking infrastructure support to grids in particular (for example, in optical networks). Also, numerous activities in the Internet community relate closely to the optimal use of TCP/IP in the Grid environment (for example, high-speed TCP).

*Grid Networks* can serve even newcomers to grids; it offers an overview of main Grid components, including middleware, and explains the Grid’s merits. Although the book isn’t cheap, networking professionals (and Grid-oriented experts and application developers) will certainly benefit from its up-to-date content and its references providing pointers to further information.

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**Related Links**

- DS Online's Grid Computing Community
- "Sensor Networks + Grid Computing = A New Challenge for the Grid?" *IEEE Distributed Systems Online*
- "Grid Technology Concepts from A to Z," *IEEE Distributed Systems Online*

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