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Autore	Siddiqui Mumtaz
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Sommario/riassunto	In a dynamic computing environment, such as the Grid, resource management plays a crucial role in making distributed resources available on demand to anyone from anywhere at any time without undermining the resource autonomy; this becomes an art when dealing with heterogeneous resources distributed amongst multiple trust domains spanning the Internet. Today, Grid execution environments provide abstract workflow descriptions that need a dynamic mapping to actual deployments; this further accentuates the importance of resource management in the Grid. This monograph renders boundaries of Grid resource management, identifies research challenges and proposes new solutions with innovative techniques for on-demand provisioning, automatic deployments, dynamic synthesis, negotiation-based advance reservation and capacity planning of Grid resources. Grid capacity planning is performed with multi-constrained optimized resource allocations by modeling resource allocation as an on-line strip

packing problem and introducing a new solution that optimizes resource utilization and QoS while generating contention-free solutions. The book further explains the use of semantic web technologies in the Grid to specify explicit definitions and unambiguous machine interpretable resource descriptions for intelligent resource matching and synthesis; the synthesis process generates new compound resources with aggregated capabilities and prowess. The techniques introduced have been developed and integrated in the ASKALON Grid application development and runtime environment, deployed in the Austrian Grid, and are demonstrated in this book by means of well-performed experiments.