Preface

The ERCIM CoreGRID working group includes a large number of European scientists working to achieve high-level research objectives in Grid and Peer-to-Peer systems. The working group brings together a critical mass of well-established researchers from more than forty European institutions active in the fields of distributed systems and middleware, models, algorithms, tools and environments.

Guarantees for quality of service in Distributed Computing Infrastructures like Grid and Clouds have turned out to be a critical as the different technology stacks became more mature and operational for production usage. The integration service-oriented architecture concepts in the Grid computing model and the growing impact of Cloud Computing put in place new technological solutions in the world of service-oriented architectures. Service-oriented Grids provide effective solutions in science and business as they offer interoperable high-performance systems for handling data- and compute-intensive distributed applications. In parallel, new methods and technologies became necessary allowing to negotiate and agree on the quality of services leading to electronic Service Level Agreements (SLAs).

This book is the 13^{th} volume of the CoreGRID book series and it brings together scientific contributions by researchers and scientists working on different aspects of Service Level Agreements. The book includes contributions presented at the Dagstuhl Seminar *Service Level Agreements in Grids* organised between March 22^{nd} to 27^{th} 2009, and the IEEE *Workshop on Service Level Agreements in Grids*, which was held on October 13, 2009. This was the second workshop of its kind. The first workshop took place in Austin, Texas, US in 2007.

The objectives of both the seminar and the workshop are

- to discuss the current state of the art and new approaches in application areas that apply Service Level Agreements in the context of Grids, Clouds and distributed systems;
- to provide a forum for exchanging ideas between the different research communities focussing inter alia on agent-based approaches to SLA man-

agement, Grid economics, and SLA-based Grid resource management and scheduling;

- to jointly work towards the development of an automated and standardized electronic negotiation of Service Level Agreements; and
- to provide input to the CoreGRID ERCIM Working Group.

This book contains 15 chapters. The first and the second focus on approaches to monitor Service Level Agreements. The third chapter presents experience made with the implementation of the Open Grid Forum's Web Services Agreement specification. The fourth chapter presents benefits of SLA-enabled resource management, while chapter five discusses the role of distributed trust management for validating SLA choreographies.

The sixth chapter presents an overview on how Service Level Agreement approaches are used for financial Grid applications. Chapter seven then identifies issues of SLA negotiation between autonomous agents and proposes a notation for expressing intervals. The eighth chapter presents an overview on the application of Service Level Agreements for Green IT. Chapter nine and ten introduce two extensions to the Web Services Agreement standard, as there are an approach for a multi-round negotiation extension in chapter nine and an extension to Web Services Agreement to create open Cloud markets in chapter ten, respectively.

Chapter eleven describes a novel approach for a service economy infrastructure, based on structured protocol descriptions and software-agent technology. Chapter twelve gives an overview on implementation and usage of SLAs in the European project BREIN. The thirteenth chapter discusses recent advances in the field of negotiation and the definition of Quality of Service characteristics, and proposes some additional features that can help both consumers and producers during the enactment of services. Chapter fourteen present first results in establishing adaptable, versatile, and dynamic services considering negotiation boot-strapping and service mediation with a focus on meta-negotiation and SLA mapping solutions for Grid or Cloud services representing important prerequisites for the establishment of autonomic services. The last chapter then deals with the negotiation of Service Level Agreements and introduces an automated negotiation techniques between web services for the formation of virtual organisations.

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