



Resource Optimization and Security for Cloud Services

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DESCRIPTION

This book includes a study of trustworthiness, percentile response time, service availability, and authentication in the networks between users and cloud service providers, and at service stations or sites that may be owned by different service providers. The first part of the book contains an analysis of percentile response time, which is one of the most important SLA (service level agreements) metrics. Effective and accurate numerical solutions for the calculation of the percentile response time in single-class and multi-class queueing networks are obtained. Then, the numerical solution is incorporated in a resource allocation problem. Specifically, the authors present an approach for the resource optimization that minimizes the total cost of computer resources required while preserving a given percentile of the response time. In the second part, the approach is extended to consider trustworthiness, service availability, and the percentile of response time in Web services. These QoS metrics are clearly defined and their quantitative analysis provided. The authors then take into account these QoS metrics in a trust-based resource allocation problem in which a set of cloud computing resources is used by a service provider to host a typical Web services application for single-class customer services and multipleclass customer services respectively. Finally, in the third part of the book a thorough performance evaluation of two notable public key cryptography-based authentication techniques; Public-Key Cross Realm Authentication in Kerberos (PKCROSS) and Public Key Utilizing Tickets for Application Servers (PKTAPP, a.k.a. KX.509/KCA); is given, in terms of computational and communication times. The authors then demonstrate their performance difference using queueing networks. PKTAPP has been proposed to address the scalability issue of PKCROSS. However, their in-depth analysis of these two techniques shows that PKTAPP does not perform

better than PKCROSS in a large-scale system. Thus, they propose a new public key cryptography-based group authentication technique. The performance analysis demonstrates that the new technique can scale better than PKCORSS and PKTAPP.

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