

Jens Kohler

**Optimizing Query Strategies in
Fixed Vertical Partitioned and
Distributed Databases and their
Application in Semantic Web
Databases**

Berichte aus der Informatik

Jens Kohler

**Optimizing Query Strategies in Fixed Vertical
Partitioned and Distributed Databases and their
Application in Semantic Web Databases**

Shaker Verlag
Aachen 2018

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at <http://dnb.d-nb.de>.

Zugl.: Bulgarian Academy of Science, Diss., 2018

Copyright Shaker Verlag 2018

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the publishers.

Printed in Germany.

ISBN 978-3-8440-6097-3

ISSN 0945-0807

Shaker Verlag GmbH • P.O. BOX 101818 • D-52018 Aachen

Phone: 0049/2407/9596-0 • Telefax: 0049/2407/9596-9

Internet: www.shaker.de • e-mail: info@shaker.de

Abstract

Storing data in relational databases has a long history. Such relational databases still build the foundation for various applications throughout all application domains even with today's growing data volumes. Thus, despite a rapid dissemination of In-Memory or NoSQL databases, relational databases will keep their important role, as it is considered not very likely that NoSQL databases will replace them in the near future. Hence, also relational databases are used as a foundation to store huge volumes of data and this is exactly where Cloud Computing offers dynamic and scalable capabilities. Renting such technological assets and capabilities from external cloud providers is an interesting approach.

As there are still open and unanswered data security and data protection challenges, the usage of especially public Cloud Computing is far behind its expectations. An approach that contributes to the broad dissemination of using especially public clouds is *SeDiCo*, a framework for a *SE*cure and *DI*stributed Cloud Data stOre. The key concept of this approach is to vertically partition relational database data and store the respective partitions in different databases operated in different clouds. The author of this work firstly proposed this so-called *security-by-distribution* concept in 2012 and developed and implemented it prototypically. Although these works proved the technological feasibility, the approach still suffers from severe performance problems when the partitioned and distributed data are accessed.

These performance issues are in the focus of this thesis, which aims at investigating, developing and evaluating new ways of accessing those data.