
Cloud Computing Data Intensive Computing And Scheduling Chapman Hallcrc Numerical Analysis And Scientific Computing Series

Data Intensive Computing Applications for Big Data
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High Performance Computing for Big Data
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Data-Intensive Science

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JOSHUA ASHTYN

**Data Intensive Computing
Applications for Big Data** "O'Reilly
Media, Inc."

Cloud computing offers many advantages to researchers and engineers who need access to high performance computing facilities for solving particular compute-intensive and/or large-scale problems, but whose overall high performance computing (HPC) needs do not justify the acquisition and operation of dedicated HPC facilities. There are, however, a number of fundamental problems which must be addressed, such as the limitations imposed by accessibility, security and communication speed, before these advantages can be exploited to the full. This book presents 14 contributions selected from the International Research Workshop on Advanced High Performance Computing Systems, held in Cetraro, Italy, in June 2012. The papers are arranged in three chapters. Chapter 1 includes five papers on cloud infrastructures, while Chapter 2 discusses cloud applications. The third chapter in the book deals with big data, which is nothing new – large scientific

organizations have been collecting large amounts of data for decades – but what is new is that the focus has now broadened to include sectors such as business analytics, financial analyses, Internet service providers, oil and gas, medicine, automotive and a host of others. This book will be of interest to all those whose work involves them with aspects of cloud computing and big data applications.

*Knowledge Management in the
Development of Data-Intensive Systems*
Morgan Kaufmann

Workflows may be defined as abstractions used to model the coherent flow of activities in the context of an in silico scientific experiment. They are employed in many domains of science such as bioinformatics, astronomy, and engineering. Such workflows usually present a considerable number of activities and activations (i.e., tasks associated with activities) and may need a long time for execution. Due to the continuous need to store and process data efficiently (making them data-intensive workflows), high-performance computing environments allied to parallelization techniques are used to run these workflows. At the beginning of the 2010s, cloud technologies emerged as a promising environment to run scientific workflows. By using clouds, scientists have expanded beyond single parallel computers to hundreds or even

thousands of virtual machines. More recently, Data-Intensive Scalable Computing (DISC) frameworks (e.g., Apache Spark and Hadoop) and environments emerged and are being used to execute data-intensive workflows. DISC environments are composed of processors and disks in large-commodity computing clusters connected using high-speed communications switches and networks. The main advantage of DISC frameworks is that they support and grant efficient in-memory data management for large-scale applications, such as data-intensive workflows. However, the execution of workflows in cloud and DISC environments raise many challenges such as scheduling workflow activities and activations, managing produced data, collecting provenance data, etc. Several existing approaches deal with the challenges mentioned earlier. This way, there is a real need for understanding how to manage these workflows and various big data platforms that have been developed and introduced. As such, this book can help researchers understand how linking workflow management with Data-Intensive Scalable Computing can help in understanding and analyzing scientific big data. In this book, we aim to identify and distill the body of work on workflow management in clouds and DISC environments. We start by discussing the basic principles of data-intensive scientific workflows. Next, we present two workflows that are executed in a single site and multi-site clouds taking advantage of provenance. Afterward, we go towards workflow management in DISC environments, and we present, in detail, solutions that enable the optimized execution of the workflow using frameworks such as Apache Spark

and its extensions.

Data-Intensive Text Processing with MapReduce CRC Press

Computation and Storage in the Cloud is the first comprehensive and systematic work investigating the issue of computation and storage trade-off in the cloud in order to reduce the overall application cost. Scientific applications are usually computation and data intensive, where complex computation tasks take a long time for execution and the generated datasets are often terabytes or petabytes in size. Storing valuable generated application datasets can save their regeneration cost when they are reused, not to mention the waiting time caused by regeneration. However, the large size of the scientific datasets is a big challenge for their storage. By proposing innovative concepts, theorems and algorithms, this book will help bring the cost down dramatically for both cloud users and service providers to run computation and data intensive scientific applications in the cloud. Covers cost models and benchmarking that explain the necessary tradeoffs for both cloud providers and users Describes several novel strategies for storing application datasets in the cloud Includes real-world case studies of scientific research applications Covers cost models and benchmarking that explain the necessary tradeoffs for both cloud providers and users Describes several novel strategies for storing application datasets in the cloud Includes real-world case studies of scientific research applications

Recent Trends in Intensive Computing
Morgan & Claypool Publishers
High-Performance Computing for Big Data: Methodologies and Applications
explores emerging high-performance

architectures for data-intensive applications, novel efficient analytical strategies to boost data processing, and cutting-edge applications in diverse fields, such as machine learning, life science, neural networks, and neuromorphic engineering. The book is organized into two main sections. The first section covers Big Data architectures, including cloud computing systems, and heterogeneous accelerators. It also covers emerging 3D IC design principles for memory architectures and devices. The second section of the book illustrates emerging and practical applications of Big Data across several domains, including bioinformatics, deep learning, and neuromorphic engineering. Features Covers a wide range of Big Data architectures, including distributed systems like Hadoop/Spark Includes accelerator-based approaches for big data applications such as GPU-based acceleration techniques, and hardware acceleration such as FPGA/CGRA/ASICs Presents emerging memory architectures and devices such as NVM, STT- RAM, 3D IC design principles Describes advanced algorithms for different big data application domains Illustrates novel analytics techniques for Big Data applications, scheduling, mapping, and partitioning methodologies Featuring contributions from leading experts, this book presents state-of-the-art research on the methodologies and applications of high-performance computing for big data applications. About the Editor Dr. Chao Wang is an Associate Professor in the School of Computer Science at the University of Science and Technology of China. He is the Associate Editor of ACM Transactions on Design Automations for Electronics Systems (TODAES), Applied Soft

Computing, Microprocessors and Microsystems, IET Computers & Digital Techniques, and International Journal of Electronics. Dr. Chao Wang was the recipient of Youth Innovation Promotion Association, CAS, ACM China Rising Star Honorable Mention (2016), and best IP nomination of DATE 2015. He is now on the CCF Technical Committee on Computer Architecture, CCF Task Force on Formal Methods. He is a Senior Member of IEEE, Senior Member of CCF, and a Senior Member of ACM.

Computation and Storage in the Cloud IGI Global

This book consists of eight chapters, five of which provide a summary of the tutorials and workshops organised as part of the cHiPSet Summer School: High-Performance Modelling and Simulation for Big Data Applications Cost Action on “New Trends in Modelling and Simulation in HPC Systems,” which was held in Bucharest (Romania) on September 21–23, 2016. As such it offers a solid foundation for the development of new-generation data-intensive intelligent systems. Modelling and simulation (MS) in the big data era is widely considered the essential tool in science and engineering to substantiate the prediction and analysis of complex systems and natural phenomena. MS offers suitable abstractions to manage the complexity of analysing big data in various scientific and engineering domains. Unfortunately, big data problems are not always easily amenable to efficient MS over HPC (high performance computing). Further, MS communities may lack the detailed expertise required to exploit the full potential of HPC solutions, and HPC architects may not be fully aware of specific MS requirements. The main goal of the Summer School was to improve

the participants' practical skills and knowledge of the novel HPC-driven models and technologies for big data applications. The trainers, who are also the authors of this book, explained how to design, construct, and utilise the complex MS tools that capture many of the HPC modelling needs, from scalability to fault tolerance and beyond. In the final three chapters, the book presents the first outcomes of the school: new ideas and novel results of the research on security aspects in clouds, first prototypes of the complex virtual models of data in big data streams and a data-intensive computing framework for opportunistic networks. It is a valuable reference resource for those wanting to start working in HPC and big data systems, as well as for advanced researchers and practitioners. Mastering Cloud Computing National Academies Press

This book presents new approaches that advance research in all aspects of agent-based models, technologies, simulations and implementations for data intensive applications. The nine chapters contain a review of recent cross-disciplinary approaches in cloud environments and multi-agent systems, and important formulations of data intensive problems in distributed computational environments together with the presentation of new agent-based tools to handle those problems and Big Data in general. This volume can serve as a reference for students, researchers and industry practitioners working in or interested in joining interdisciplinary work in the areas of data intensive computing and Big Data systems using emergent large-scale distributed computing paradigms. It will also allow newcomers to grasp key concepts and potential solutions on advanced topics of

theory, models, technologies, system architectures and implementation of applications in Multi-Agent systems and data intensive computing.

Data Intensive Storage Services for Cloud Environments Elsevier

Describes principles of the emerging field of data-intensive computing, along with methods for designing, managing and analyzing the big data sets of today.

Handbook of Data Intensive Computing Springer

Describes principles of the emerging field of data-intensive computing, along with methods for designing, managing and analyzing the big data sets of today.

Handbook of Cloud Computing IOS Press

Big Data Systems encompass massive challenges related to data diversity, storage mechanisms, and requirements of massive computational power.

Further, capabilities of big data systems also vary with respect to type of problems. For instance, distributed memory systems are not recommended for iterative algorithms. Similarly, variations in big data systems also exist related to consistency and fault tolerance. The purpose of this book is to provide a detailed explanation of big data systems. The book covers various topics including Networking, Security, Privacy, Storage, Computation, Cloud Computing, NoSQL and NewSQL systems, High Performance Computing, and Deep Learning. An illustrative and practical approach has been adopted in which theoretical topics have been aided by well-explained programming and illustrative examples. Key Features: Introduces concepts and evolution of Big Data technology. Illustrates examples for thorough understanding. Contains programming examples for hands on development. Explains a variety of topics

including NoSQL Systems, NewSQL systems, Security, Privacy, Networking, Cloud, High Performance Computing, and Deep Learning. Exemplifies widely used big data technologies such as Hadoop and Spark. Includes discussion on case studies and open issues. Provides end of chapter questions for enhanced learning.

Intelligent Agents in Data-intensive Computing MDPI

Distributed and Cloud Computing: From Parallel Processing to the Internet of Things offers complete coverage of modern distributed computing technology including clusters, the grid, service-oriented architecture, massively parallel processors, peer-to-peer networking, and cloud computing. It is the first modern, up-to-date distributed systems textbook; it explains how to create high-performance, scalable, reliable systems, exposing the design principles, architecture, and innovative applications of parallel, distributed, and cloud computing systems. Topics covered by this book include: facilitating management, debugging, migration, and disaster recovery through virtualization; clustered systems for research or ecommerce applications; designing systems as web services; and social networking systems using peer-to-peer computing. The principles of cloud computing are discussed using examples from open-source and commercial applications, along with case studies from the leading distributed computing vendors such as Amazon, Microsoft, and Google. Each chapter includes exercises and further reading, with lecture slides and more available online. This book will be ideal for students taking a distributed systems or distributed computing class, as well as for professional system designers and engineers looking for a

reference to the latest distributed technologies including cloud, P2P and grid computing. Complete coverage of modern distributed computing technology including clusters, the grid, service-oriented architecture, massively parallel processors, peer-to-peer networking, and cloud computing. Includes case studies from the leading distributed computing vendors: Amazon, Microsoft, Google, and more Explains how to use virtualization to facilitate management, debugging, migration, and disaster recovery Designed for undergraduate or graduate students taking a distributed systems course—each chapter includes exercises and further reading, with lecture slides and more available online

Data Intensive Computing for Biodiversity CRC Press

The objective of this book is to introduce the basic concepts of big data computing and then to describe the total solution of big data problems using HPCC, an open-source computing platform. The book comprises 15 chapters broken into three parts. The first part, Big Data Technologies, includes introductions to big data concepts and techniques; big data analytics; and visualization and learning techniques. The second part, LexisNexis Risk Solution to Big Data, focuses on specific technologies and techniques developed at LexisNexis to solve critical problems that use big data analytics. It covers the open source High Performance Computing Cluster (HPCC Systems®) platform and its architecture, as well as parallel data languages ECL and KEL, developed to effectively solve big data problems. The third part, Big Data Applications, describes various data intensive applications solved on HPCC Systems. It includes applications such as cyber security, social network

analytics including fraud, Ebola spread modeling using big data analytics, unsupervised learning, and image classification. The book is intended for a wide variety of people including researchers, scientists, programmers, engineers, designers, developers, educators, and students. This book can also be beneficial for business managers, entrepreneurs, and investors. Data-Intensive Computing Springer Data Intensive Computing refers to capturing, managing, analyzing, and understanding data at volumes and rates that push the frontiers of current technologies. The challenge of data intensive computing is to provide the hardware architectures and related software systems and techniques which are capable of transforming ultra-large data into valuable knowledge. Handbook of Data Intensive Computing is written by leading international experts in the field. Experts from academia, research laboratories and private industry address both theory and application. Data intensive computing demands a fundamentally different set of principles than mainstream computing. Data-intensive applications typically are well suited for large-scale parallelism over the data and also require an extremely high degree of fault-tolerance, reliability, and availability. Real-world examples are provided throughout the book. Handbook of Data Intensive Computing is designed as a reference for practitioners and researchers, including programmers, computer and system infrastructure designers, and developers. This book can also be beneficial for business managers, entrepreneurs, and investors. Data Analysis in the Cloud CRC Press Data Intensive Computing refers to capturing, managing, analyzing, and understanding data at volumes and

rates that push the frontiers of current technologies. The challenge of data intensive computing is to provide the hardware architectures and related software systems and techniques which are capable of transforming ultra-large data into valuable knowledge. Handbook of Data Intensive Computing is written by leading international experts in the field. Experts from academia, research laboratories and private industry address both theory and application. Data intensive computing demands a fundamentally different set of principles than mainstream computing. Data-intensive applications typically are well suited for large-scale parallelism over the data and also require an extremely high degree of fault-tolerance, reliability, and availability. Real-world examples are provided throughout the book. Handbook of Data Intensive Computing is designed as a reference for practitioners and researchers, including programmers, computer and system infrastructure designers, and developers. This book can also be beneficial for business managers, entrepreneurs, and investors. Cloud Computing and Big Data Springer Science & Business Media As more and more data is generated at a faster-than-ever rate, processing large volumes of data is becoming a challenge for data analysis software. Addressing performance issues, Cloud Computing: Data-Intensive Computing and Scheduling explores the evolution of classical techniques and describes completely new methods and innovative algorithms. The *Handbook of Data Intensive Computing* IOS Press Foreword. A transformed scientific method. Earth and environment. Health and wellbeing. Scientific infrastructure. Scholarly communication.

High Performance Computing for Big Data Cambridge University Press

For the last four decades, parallel computing platforms have increasingly formed the basis for the development of high performance systems primarily aimed at the solution of intensive computing problems, and the application of parallel computing systems has also become a major factor in furthering scientific research. But such systems also offer the possibility of solving the problems encountered in the processing of large-scale scientific data sets, as well as in the analysis of Big Data in the fields of medicine, social media, marketing, economics etc. This book presents papers from the International Research Workshop on Advanced High Performance Computing Systems, held in Cetraro, Italy, in July 2016. The workshop covered a wide range of topics and new developments related to the solution of intensive and large-scale computing problems, and the contributions included in this volume cover aspects of the evolution of parallel platforms and highlight some of the problems encountered with the development of ever more powerful computing systems. The importance of future large-scale data science applications is also discussed. The book will be of particular interest to all those involved in the development or application of parallel computing systems.

Big Data Systems Newnes

Workflows may be defined as abstractions used to model the coherent flow of activities in the context of an *in silico* scientific experiment. They are employed in many domains of science such as bioinformatics, astronomy, and engineering. Such workflows usually present a considerable number of

activities and activations (i.e., tasks associated with activities) and may need a long time for execution. Due to the continuous need to store and process data efficiently (making them data-intensive workflows), high-performance computing environments allied to parallelization techniques are used to run these workflows. At the beginning of the 2010s, cloud technologies emerged as a promising environment to run scientific workflows. By using clouds, scientists have expanded beyond single parallel computers to hundreds or even thousands of virtual machines. More recently, Data-Intensive Scalable Computing (DISC) frameworks (e.g., Apache Spark and Hadoop) and environments emerged and are being used to execute data-intensive workflows. DISC environments are composed of processors and disks in large-commodity computing clusters connected using high-speed communications switches and networks. The main advantage of DISC frameworks is that they support and grant efficient in-memory data management for large-scale applications, such as data-intensive workflows. However, the execution of workflows in cloud and DISC environments raise many challenges such as scheduling workflow activities and activations, managing produced data, collecting provenance data, etc. Several existing approaches deal with the challenges mentioned earlier. This way, there is a real need for understanding how to manage these workflows and various big data platforms that have been developed and introduced. As such, this book can help researchers understand how linking workflow management with Data-Intensive Scalable Computing can help in understanding and analyzing scientific

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Data-Intensive Computing IGI Global
Welcome to the proceedings of CloudComp 2009. A computing cloud is more than a collection of computer resources, because it provides mechanisms to manage those resources. In a cloud computing platform, software is migrating from the desktop to the "clouds," promising users, at any time and anywhere, access to their programs and data. This year, 44 academic, industrial and student papers from all over the world were submitted, of which 17 were accepted as regular long papers. Additionally, three were included as short papers on hot topics. The Program Committee appreciates the time and effort of all of the researchers put into preparing their papers. Many thanks also to the members of the Program Committee and the external reviewers for all of their hard work in reading, evaluating, and providing detailed feedback. Without the contributions of both of these groups, CloudComp would not have been such a lively symposium. The symposium featured keynote addresses by Jesus Villasante, Head of Unit, European Commission, Dane Walther, Director of Custom Engineering, Akamai Technologies Inc. Cambridge,

MA, USA, Greg Malewicz, Google, Mountain View, CA, USA, and Mauro Campanella, Consortium GARR, Italy. A scientific visit of the Leibniz Supercomputer Centre (LRZ), Bavarian Academy of Science, Garching (Munich), was organized during the conference. The visit was hosted by Prof. A. Bode. We feel that the symposium will grow and develop in its service to the research community within both academia and industry.

Cloud Computing Springer

In a world where computer science is now an essential element in all of our lives, a new opportunity to disseminate the latest research and trends is always welcome. This book presents the proceedings of the first International Conference on Recent Trends in Computing (ICRTC 2021), which was held as a virtual event on 21 - 22 May 2021 at Sanjivani College of Engineering, Kopergaon, India due to the restrictions of the COVID-19 pandemic. This online conference, aimed at facilitating academic exchange among researchers, enabled experts and scholars around from around the globe to gather for the discussion of the latest advanced research in the field despite the extensive travel restrictions still in place. The book contains 134 papers selected from 329 submitted papers after a rigorous peer-review process, and topics covered include advanced computing, networking, informatics, security and privacy, and other related fields. The book will be of interest to all those eager to find the latest trends and most recent developments in computer science.

High-Performance Big-Data

Analytics Springer Nature

Data Analysis in the Cloud introduces and discusses models, methods, techniques, and systems to analyze the

large number of digital data sources available on the Internet using the computing and storage facilities of the cloud. Coverage includes scalable data mining and knowledge discovery techniques together with cloud computing concepts, models, and systems. Specific sections focus on map-reduce and NoSQL models. The book also includes techniques for conducting high-performance distributed analysis of large data on clouds. Finally, the book

examines research trends such as Big Data pervasive computing, data-intensive exascale computing, and massive social network analysis. Introduces data analysis techniques and cloud computing concepts Describes cloud-based models and systems for Big Data analytics Provides examples of the state-of-the-art in cloud data analysis Explains how to develop large-scale data mining applications on clouds Outlines the main research trends in the area of scalable Big Data analysis

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