

Cloud Computing And Computer Clouds Cs Cs Department

Cloud computing has provided multiple advantages as well as challenges to software and infrastructure services. In order to be fully beneficial, these challenges facing cloud specific communication protocols must be addressed. Communication Infrastructures for Cloud Computing presents the issues and research directions for a broad range of cloud computing aspects of software, computing, and storage systems. This book will highlight a broad range of topics in communication infrastructures for cloud computing that will benefit researchers, academics, and practitioners in the active fields of engineering, computer science, and software.

For cloud users and providers alike, security is an everyday concern, yet there are very few books covering cloud security as a main subject. This book will help address this information gap from an Information Technology solution and usage-centric view of cloud infrastructure security. The book highlights the fundamental technology components necessary to build and enable trusted clouds. Here also is an explanation of the security and compliance challenges organizations face as they migrate mission-critical applications to the cloud, and how trusted clouds, that have their integrity rooted in hardware, can address these challenges. This book provides: Use cases and solution reference architectures to enable infrastructure integrity and the creation of trusted pools leveraging Intel Trusted Execution Technology (TXT), Trusted geo-location management in the cloud, enabling workload and data location compliance and boundary control usage in the cloud. OpenStack-based reference architecture of tenant-controlled virtual machine and workload protection in the cloud. A reference design to enable secure hybrid clouds for a cloud bursting use case, providing infrastructure visibility and control to organizations. "A valuable guide to the next generation of cloud security and hardware based root of trust. More than an explanation of the what and how, is the explanation of why. And why you can't afford to ignore it!" –Vince Lubsey, Vice President, Product Development, Virtustream Inc. "Raghu provides a valuable reference for the new 'inside out' approach, where trust in hardware, software, and privileged users is never assumed-but instead measured, attested, and limited according to least privilege principles." –John Skinner, Vice President, HyTrust Inc. "Traditional parameter based defenses are in sufficient in the cloud. Raghu's book addresses this problem head-on by highlighting unique usage models to enable trusted infrastructure in this open environment. A must read if you are exposed in cloud." –Nikhil Sharma, Sr. Director of Cloud Solutions, Office of CTO, EMC Corporation

The purpose of this book is first to study cloud computing concepts, security concern in clouds and data centers, live migration and its importance for cloud computing, the role of firewalls in domains with particular focus on virtual machine (VM) migration and its security concerns. The book then tackles design, implementation of the frameworks and prepares test-beds for testing and evaluating VM migration procedures as well as firewall rule migration. The book demonstrates how cloud computing can produce an effective way of network management, especially from a security perspective.

Explores cloud computing, breaking down the concepts, models, mechanisms, and architectures of this technology while allowing for the financial assessment of resources and how they compare to traditional storage systems.

Mastering Cloud Computing

The Cloud Computing Book

Software-Defined Cloud Centers

7th International Conference, CloudComp 2016, and First International Conference, SPNCC 2016, Guangzhou, China, November 25–26, and December 15–16, 2016, Proceedings

A Holistic Perspective

In the era of the Internet of Things and Big Data, Cloud Computing has recently emerged as one of the latest buzzwords in the computing industry. It is the latest evolution of computing, where IT recourses are offered as services. Cloud computing provides on-demand, scalable, device-independent, and reliable services to its users. The exponential growth of digital data bundled with the needs of analysis, processing and storage, and cloud computing has paved the way for a cheap, secure, and omnipresent computing framework allowing for the delivery of enormous computing and storage capacity to a diverse community of end-recipients. Clouds are distributed technology platforms that leverage sophisticated technology innovations to provide highly scalable and resilient environments that can be remotely utilized by organizations in a multitude of powerful ways. The term cloud is often used as a metaphor for the Internet and can be defined as a new type of utility computing that basically uses servers that have been made available to third parties via the Internet.

Cloud computing continues to emerge as a subject of substantial industrial and academic interest. Although the meaning and scope of "cloud computing" continues to be debated, the current notion of clouds blurs the distinctions between grid services, web services, and data centers, among other areas. Clouds also bring considerations of lowering the cost for relatively bursty applications to the fore. Cloud Computing: Principles, Systems and Applications is an essential reference/guide that provides thorough and timely examination of the services, interfaces and types of applications that can be executed on cloud-based systems. The book identifies and highlights state-of-the-art techniques and methods for designing cloud systems, presents mechanisms and schemes for linking clouds to economic activities, and offers balanced coverage of all related technologies that collectively contribute towards the realization of cloud computing. With an emphasis on the conceptual and systemic links between cloud computing and other distributed computing approaches, this text also addresses the practical importance of efficiency, scalability, robustness and security as the four cornerstones of quality of service. Topics and features: explores the relationship of cloud computing to other distributed computing paradigms, namely peer-to-peer, grids, high performance computing and web services; presents the principles, techniques, protocols and algorithms that can be adapted from other distributed computing paradigms to the development of successful clouds; includes a Foreword by Professor Mark Baker of the University of Reading, UK; examines current cloud-practical applications and highlights early deployment experiences; elaborates the economic schemes needed for clouds to become viable business models. This book will serve as a comprehensive reference for researchers and students engaged in cloud computing. Professional system architects, technical managers, and IT consultants will also find this unique text a practical guide to the application and delivery of commercial cloud services. Prof. Nick Antonopoulos is Head of the School of Computing, University of Derby, UK. Lee Gillam is a Lecturer in the Department of Computing at the University of Surrey, UK.

The on-demand availability of computer system resources without direct active management by the user is known as cloud computing. It is usually used to refer to the data centers, which are available over the Internet to many users. A few major types of clouds are enterprise clouds, public clouds and hybrid cloud. Enterprise clouds, also called private clouds, are usually limited to a single organization while public clouds are available to many organizations. A hybrid cloud is a cloud computing service, which is made up of a fusion of public, private and community cloud services. Cloud computing majorly relies on sharing of resources to achieve economies of scale and coherence. Cloud computing is an upcoming field of science that has undergone rapid development over the past few decades. Different approaches, concepts and technologies related to this field have been included in this book. It will serve as a reference to a broad spectrum of readers.

The primary purpose of this book is to capture the state-of-the-art in Cloud Computing technologies and applications. The book will also aim to identify potential research directions and technologies that will facilitate creation a global market-place of cloud computing services supporting scientific, industrial, business, and consumer applications. We expect the book to serve as a reference for larger audience such as systems architects, practitioners, developers, new researchers and graduate level students. This area of research is relatively recent, and as such has no existing reference book that addresses it. This book will be a timely contribution to a field that is gaining considerable research interest, momentum, and is expected to be of increasing interest to commercial developers. The book is targeted for professional computer science developers and graduate students especially at Masters level. As Cloud Computing is recognized as one of the top five emerging technologies that will have a major impact on the quality of science and society over the next 20 years, its knowledge will help position our readers at the forefront of the field.

Delivery and Adoption of Cloud Computing Services in Contemporary Organizations

An Introduction

How Does Cloud Computing Work?

Technology and Practices

Cloud Computing with e-Science Applications

Cloud computing has become a significant technology trend. Experts believe cloud computing is currently reshaping information technology and the IT marketplace. The advantages of using cloud computing include cost savings, speed to market, access to greater computing resources, high availability, and scalability. Handbook of Cloud Computing includes contributions from world experts in the field of cloud computing from academia, research laboratories and private industry. This book presents the systems, tools, and services of the leading providers of cloud computing: including Google, Yahoo!, Amazon, IBM, and Microsoft. The book also covers cloud computing and cloud computing applications are also introduced. Current and future technologies applied in cloud computing are also discussed. Case studies, examples, and exercises are provided throughout. Handbook of Cloud Computing is intended for advanced-level students and researchers in computer science and electrical engineering as a reference book. This handbook is also beneficial to computer and system infrastructure designers, developers, business managers, entrepreneurs and investors within the cloud computing related industry.

The easy way to understand and implement cloud computing technology written by a team of experts Cloud computing can be difficult to understand at first, but the cost-saving possibilities are great and many companies are getting on board. If you've been put in charge of implementing cloud computing, this straightforward, plain-English guide clears up the confusion and helps you get your plan in place. You'll learn how cloud computing enables you to run a more green IT infrastructure, and access technology-enabled services from the Internet ('in the cloud') without having to understand, manage, or invest in the technology infrastructure that supports them. You'll also find out what you need to consider when implementing a plan, how to handle security issues, and more. Cloud computing is a way for businesses to take advantage of storage and virtual services through the Internet, saving money on infrastructure and support. This book provides a clear definition of cloud computing from the utility computing standpoint and also addresses security concerns Offers practical guidance on delivering and managing cloud computing services effectively and efficiently Presents a proactive and pragmatic approach to implementing cloud computing in an organization and understand the benefits and challenges of cloud computing, how to select a service, and what's involved in getting it up and running Highly experienced author team consults and gives presentations on emerging technologies Cloud Computing For Dummies gets straight to the point, providing the practical information you need to know.

Complex Systems and Clouds: A Self-Organization and Self-Management Perspective provides insights into the intricate world of self-organizing systems. Large scale distributed computer systems have evolved into very complex systems and are at the point where they need to borrow self-adapting organizing concepts from nature. The book explores complexity in big distributed systems and in the natural processes in physics and chemistry, building a platform for understanding how self-organization in big distributed systems can be achieved. It goes beyond the theoretical description of self-organization to present principles for designing self-organizing systems, and concludes by showing the need for a paradigm shift in the development of large-scale systems from strictly deterministic to non-deterministic and adaptive. Analyzes the effect of self-organization applied to computer clouds Further research on principles of self-organization of computing and communication systems inspired by a wealth of self-organizing processes and phenomena in nature and society Presents a unique analysis of the field, with solutions and case studies

The concept of cloud computing has become an increasingly significant in scientific fields, where substantial amounts of data must be captured, communicated, aggregated, stored, and analysed. Cloud Computing with e-Science Applications explains how cloud computing can improve data management in data-heavy fields such as bioinformatics, earth science, and computer science. The book begins with an overview of cloud models supplied by the National Institute of Standards and Technology (NIST), and then: Discusses the challenges imposed by big data on scientific data infrastructures, including security and trust issues Covers vulnerabilities such as data theft or loss, privacy concerns, infected applications, threats in virtualization, and cross-virtual machine attacks Describes the implementation of workflows in clouds, proposing an architecture composed of two layers-platform and application Details infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS), and software-as-a-service (SaaS) solutions based on public, private, and hybrid cloud computing models Demonstrates how cloud computing aids in resource control, vertical and horizontal scalability, interoperability, and adaptive scheduling Featuring significant contributions from research centers, universities, and industries worldwide, Cloud Computing with e-Science Applications presents innovative cloud migration methodologies applicable to a variety of fields where large data sets are produced. The book provides the scientific community with an essential reference for moving applications to the cloud.

A Theory of Statistical Separability in Cognitive Systems (Project Para)

Distributed and Cloud Computing

Concepts, Technology & Architecture

Building the Infrastructure for Cloud Security

The Future of Computing Explained

*** This will be the only complete virtualization reference on the market; brings all virtualization technologies together * Microsoft has shifted its training strategy to include virtual machine technology in all new ALS/MOC courses, which leads to high demand for knowledge about this technology * Covers both Microsoft and Linux environments**

Cloud Computing: Theory and Practice provides students and IT professionals with an in-depth analysis of the cloud from the ground up. Beginning with a discussion of parallel computing and architectures and distributed systems, the book turns to contemporary cloud infrastructures, how they are being deployed at leading companies such as Amazon, Google and Apple, and how they can be applied in fields such as healthcare, banking and science. The volume also examines how to successfully deploy a cloud application across the enterprise using virtualization, resource management and the right amount of networking support, including content delivery networks and storage area networks. Developers will find a complete introduction to application development provided on a variety of platforms. Learn about recent trends in cloud computing in critical areas such as resource management, security, energy consumption, ethics, and complex systems Get a detailed hands-on set of practical recipes that help simplify the deployment of a cloud based system for practical use of computing clouds along with an in-depth discussion of several projects Understand the evolution of cloud computing and why the cloud computing paradigm has a better chance to succeed than previous efforts in large-scale distributed computing

Business and IT organizations are currently embracing new strategically sound concepts in order to be more customer-centric, competitive, and cognitive in their daily operations. While useful, the various software tools, pioneering technologies, as well as their unique contributions largely go unused due to the lack of information provided on their special characteristics. Novel Practices and Trends in Grid and Cloud Computing is a collection of innovative research on the key concerns of cloud computing and how they are being addressed, as well as the various technologies and tools empowering cloud theory to be participative, penetrative, pervasive, and persuasive. While highlighting topics including cyber security, smart technology, and artificial intelligence, this book is ideally designed for students, researchers, and business managers on the lookout for innovative IT solutions for all the business automation software and improvisations of computational technologies.

This book presents a range of cloud computing platforms for data-intensive scientific applications. It covers systems that deliver infrastructure as a service, including: HPC as a service; virtual networks as a service; scalable and reliable storage; algorithms that manage vast cloud resources and applications runtime; and programming models that enable pragmatic programming and implementation toolkits for eScience applications. Many scientific applications in clouds are also introduced, such as bioinformatics, biology, weather forecasting and social networks. Most chapters include case studies. Cloud Computing for Data-Intensive Applications targets advanced-level students and researchers studying computer science and electrical engineering. Professionals working in cloud computing, networks, databases and more will also find this book useful as a reference.

12th IFIP TC 6/TC 11 International Conference, CMS 2011, Ghent, Belgium, October 19-21, 2011, Proceedings

From Parallel Processing to the Internet of Things

Best Practices for Transforming Legacy IT

Cloud Computing Business in Saudi Arabia

Cloud Computing, Security, Privacy in New Computing Environments

Doctoral Thesis / Dissertation from the year 2014 in the subject Computer Science - Commercial Information Technology, grade: 4.5, Egerton University, language: English, abstract: Cloud computing has 3 primary service models including SaaS, IaaS and PaaS, which are classified depending on the level for which a service user interacts with the service provider's systems in accessing memory, processing power and storage. Deployment models of cloud computing include hybrid, community, public and private clouds depending on the approach to hosting and the number of clients sharing a resource. Due to the prohibitive nature of private cloud computing and requirement for specialized systems in community clouds, the most suitable approach to cloud computing for small and medium enterprises is public cloud computing. In this regard, this study was aimed at determining the extent to which implementation of public cloud computing by enterprise companies is feasible. Due to the cultural and the absence of law in Saudi Arabia ensuring the protection of data in the cloud, challenges in implementing cloud computing in the country are related to adherence to the data governance structure. For instance, privacy and security are important for enterprise companies since the local culture values the safeguarding of family and individual information. In addition, information protection in the cloud system must adhere to the conservative philosophy and data privacy, which limits the level of compatibility in cloud computing between Saudi Arabia and the western world. Since most service providers are based in the west, companies have to identify a service provider that tailors its products to suit the market in Saudi Arabia. Therefore, implementation of public cloud computing in Saudi Arabia is feasible as long as companies select a service provider with a positive reputation, permit posting of sensitive information to the cloud server, and implement cloud computing gradually to avert the possibility of complete failure. This study determined that SaaS cloud computing is feasible for enterprise companies in Saudi Arabia, but further study is required to examine the feasibility of IaaS and PaaS. In addition, a larger study should be done to collect quantitative data to determine the implications of cloud computing in a representative sample.

This book constitutes the refereed proceedings of the 7th International Conference on Cloud Computing, Security, Privacy in New Computing Environments, CloudComp 2016, and the First EAI International Conference SPNCC 2016, both held in Guangzhou, China, in November and December 2016. The proceedings contain 10 full papers selected from 27 submissions and presented at CloudComp 2016 and 12 full papers selected from 69 submissions and presented at SPNCC 2016. CloudComp 2016 presents recent advances and experiences in clouds, cloud computing and related ecosystems and business support. SPNCC 2016 focuses on security and privacy aspects of new computing environments including mobile computing, big data, cloud computing and other large-scale environments.

Attaining computational efficiency in health care is becoming increasingly important. Currently, 17.9% of the GDP of the United States is spent on health care. It is an information intense industry, and, through private and governmental incentives, is increasingly using digital information to manage care. Cloud computing and computer virtualization have complicated the decision process around how to architect solutions for health care. Health care decision makers must seek to minimize their spending while ensuring sufficient computational capacity, regulatory compliance and security. The intensity of the use of digital information in health care is expected to increase rapidly. This dissertation makes several contributions to the fields of health care informatics and computer science. We first established motivation for studying this area by examining the attitudes of health care technology leaders throughout the United States. This research led us to believe that many health care organizations will continue to make use of private clouds for some time. Given this assumption, we examined how the predictability of health care workflows could be used to improve the use of private cloud computing infrastructures. Using historic resource requirements as a guide, we constructed an algorithm that could be used to by systems architects to make better informed hardware decisions. Continuing to use the concept of predictability, we created a system that dynamically migrated virtual machines within a private cloud in expectation of increased workload. This prescriptive migration based on history-generating foresight reduced the overhead associated with other trigger-based migration schemes of up to 99.6%. The original survey also indicated that health care technology leaders were concerned about security and the changing regulations associated with data leakages. Our research focus shifted to reducing the risk of data leakage in hybrid computing clouds. We devised a mechanism that prohibited layer three network communications between different network zones to reduce the risk of data leakage while ensuring, to the extent practical, that traditional multilevel security rules could be implemented. Finally, we proposed mechanisms required to successfully deploy health care data in a dynamic intercloud such that data could move freely between private and various public cloud providers.

Cloud ComputingPrinciples, Systems and ApplicationsSpringer

Big-Data Analytics for Cloud, IoT and Cognitive Computing

The Use of Cloud Computing in Health Care

The Perceptron

Foundations and Applications Programming

Cloud Computing for Data-Intensive Applications

Introduces the topic of cloud computing with an emphasis on the trustworthiness of cloud computing systems and services This book describes the scientific basis of cloud computing, explaining the ideas, principles, and architectures of cloud computing as well the different types of clouds and the services they provide. The text reviews several cloud computing platforms including HP, IBM, Salesforce, and Kaavo. The author addresses the problem of trustworthiness in cloud computing and provides methods to improve the security and privacy of cloud applications. The end-of-chapter exercises and supplementary material on the book's companion website will allow readers to grasp the introductory and advanced level concepts of cloud computing. Microsoft Azure, Amazon, Oracle, Google, HP, IBM, Salesforce, and Kaavo Analyzes the use of aspect-oriented programming (AOP) for refactoring cloud services and improving the security and privacy of cloud applications Contains practical examples of cloud computing, test questions, and end-of-chapter exercises Includes presentations, examples of cloud projects and case studies (http://www.vladimirsafonov.com/cloud) Trustworthy Cloud Computing is written for advanced undergraduate and graduate students in computer science, data science, and computer engineering as well as software engineers, system architects, system managers, and software developers new to cloud computing.

This book constitutes the refereed proceedings of the 12th IFIP TC 6/TC 11 International Conference on Communications and Multimedia Security, CMS 2010, held in Ghent, Belgium, in October 2011. The 26 revised papers presented were carefully reviewed and selected from 52 submissions. The papers are organized in topical sections on usability, architecture and hardware platforms, biometrics, multimedia security, network security and authentication.

Research into grid computing has been driven by the need to solve large-scale, increasingly complex problems for scientific applications. Yet the applications of grid computing for business and casual users did not begin to emerge until the development of the concept of cloud computing, fueled by advances in virtualization techniques, coupled with the increased availability of cloud computing services. This new paradigm is mainly based on its simplicity, and the affordable price for seamlessly access to both computational and storage resources. This timely text/reference introduces the fundamental principles and techniques underlying grids, clouds and virtualization technologies, as well as reviewing the latest research and expected future developments in the field of recognized experts, enabling them to develop their understanding of an area likely to play an ever more significant role in coming years. Topics and features: presents contributions from an international selection of experts in the field; provides a thorough introduction and overview of existing technologies in grids, clouds and virtualization, including a brief history of the history of virtual machines, grid computing, and cloud computing; analyzing a selection of system virtualization technologies; examines both business and scientific applications of grids and clouds; including their use in the life sciences and for high-performance computing; explores cloud building technologies, architectures for enhancing grid infrastructures with cloud computing, a clouds, workflow on grids and clouds, and cloud grid programming models. This useful text will enable interested readers to familiarize themselves with the key topics of grids, clouds and virtualization, and to contribute to new advances in the field. Researchers, undergraduates and graduate students, system designers and programmers, and IT policy makers will find this book an essential reference for their work.

Cloud computing-accessing computing resources over the Internet-is rapidly changing the landscape of information technology. Its primary benefits compared to on-premise computing models are reduced costs and increased agility and scalability. Hence, cloud computing is receiving considerable interest among several stakeholders-businesses, the IT ind

Novel Practices and Trends in Grid and Cloud Computing

Principles and Paradigms

The Enterprise Cloud

Complex Systems and Clouds

Trustworthy Cloud Computing

The definitive guide to successfully integrating social, mobile, Big-Data analytics, cloud and IoT principles and technologies The main goal of this book is to spur the development of effective big-data computing operations on smart clouds that are fully supported by IoT sensing, machine learning and analytics systems. To that end, the authors draw upon their original research and proven track record in the field to describe a practical approach integrating Big-Data analytics, cloud computing, mobile learning, data analytics and Hadoop and Spark programming. Part I focuses on data science, the roles of clouds and IoT devices and frameworks for big-data computing. Big data analytics and cognitive machine learning, as well as cloud architecture, IoT and cognitive systems are explored, and mobile cloud-IoT-interaction frameworks are illustrated with concrete system design examples. Part 2 is devoted to the principles of algorithms for machine learning, data analytics and deep learning in big data applications. Part 3 concentrates on cloud programming/software libraries from MapReduce to Hadoop, Spark and TensorFlow and describes business, educational, healthcare and social media applications for those tools. The first book describing a practical approach to integrating social, mobile, analytics, cloud and IoT (SMACIT) principles and technologies Covers theory and computing techniques and technologies, making it suitable for use in both computer science and electrical engineering programs Offers an extremely well-informed vision of future intelligent and cognitive computing environments integrating SMACIT technologies Fully illustrated throughout with complex figures and approximately 150 problems to support and reinforce learning Features a companion website with an instructor manual and PowerPoint slides www.wiley.com/go/llwngwIoT Big-Data Analytics for Cloud, IoT and Cognitive Computing satisfies the demand among university faculty and students for cutting-edge information on emerging intelligent and cognitive computing systems and technologies. Professionals working in data science, cloud computing and IoT applications will also find this book to be an extremely useful working resource.

Mastering Cloud Computing is designed for undergraduate students learning to develop cloud computing applications. Tomorrow's applications won't live on a single computer but will be deployed from and reside on a virtual server, accessible anywhere, at any time. Tomorrow's application developers need to understand the requirements of building apps for these virtual systems, including concurrent programming, high-performance computing, and data-intensive systems. The book introduces the principles of distributed and parallel computing underlying cloud architectures and specifically focuses on virtualization, thread programming, task programming, and map-reduce programming. There are examples demonstrating all of these and more, with exercises and labs throughout. Explains how to make design choices and tradeoffs to consider when building applications to run in a virtual cloud environment Real-world case studies in e-business, and energy efficiency considerations.

Social networks are part of daily life, but there seems to be no end to the number of comments and pictures one can post. Internet-e-mail providers, such as Gmail and Hotmail, are similarly common and seem to have infinite storage space. Cloud computing is part of the reason. Readers will learn the history of the Internet and computer servers leading to the modern technology of the cloud. Colorful photographs accompany clear explanations of many important tech trends and ideas, including IP addresses, ISPs, and more.

The Encyclopedia of Cloud Computing provides IT professionals, educators, researchers and students with a compendium of cloud computing knowledge. Authored by a spectrum of subject matter experts in industry and academia, this unique publication, in a single volume, covers a wide range of cloud computing topics, including technological trends and developments, research opportunities, best practices, standards, and cloud adoption. Providing multiple perspectives, it also addresses questions that stakeholders might have in the context of development, operation, management, and use of clouds. Furthermore, it examines cloud computing's impact now and in the future. The encyclopedia presents 56 chapters logically organized into 10 sections. Each chapter covers a major topic/area with cross-references to other chapters and contains tables, illustrations, side-bars as appropriate. Furthermore, each chapter presents its summary at the beginning and backend material, references and additional resources for further information.

Virtualization

A Self-Organization and Self-Management Perspective

Communication Infrastructures for Cloud Computing

An Examination of the Feasibility of Public Cloud Computing by Enterprise Businesses

Cloud Computing and Virtualization

This latest textbook from bestselling author, Douglas E. Comer, is a class-tested book providing a comprehensive introduction to cloud computing. Focusing on concepts and principles, rather than commercial offerings by cloud providers and vendors, The Cloud Computing Book: The Future of Computing Explained gives readers a complete picture of the advantages and growth of cloud computing, cloud infrastructure, virtualization, automation and orchestration, and cloud-native software design. The book explains real and virtual data center facilities, including computation (e.g., servers, hypervisors, Virtual Machines, and containers), networks (e.g., leaf-spine architecture, VLANs, and vXLAN), and storage mechanisms (e.g., SAN, NAS, and object storage). Chapters on automation and orchestration cover the conceptual organization of systems that automate software deployment and scaling. Chapters on cloud-native software cover parallelism, microservices, MapReduce, control-based designs, and serverless computing. Although it focuses on concepts and principles, the book uses popular technology examples, including Docker containers and Kubernetes. Final chapters explain security in a cloud environment and the use of models to help control the risks of cloud computing software for the cloud. The text is suitable for a one-semester course for software engineers who want to understand cloud, and for IT managers moving an organization's computing to the cloud.

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

This practical text/reference provides an exhaustive guide to setting up and sustaining software-defined data centers (SDDCs). Each of the core elements and underlying technologies are explained in detail, often supported by real-world examples. The text illustrates how cloud integration, brokerage, and orchestration can ensure optimal performance and usage of data resources, and what steps are required to secure each component in a SDDC. The coverage also includes material on hybrid cloud concepts, cloud-based data analytics, cloud configuration, enterprise DevOps and code deployment tools, and cloud software engineering. Topics and features: highlights how technologies relating to cloud computing, IoT, blockchain, and AI are revolutionizing business transactions, operations, and analytics; introduces the concept of Cloud 2.0, in which software-defined computing, storage, and networking are applied to produce next-generation cloud centers; examines software-defined storage for storage virtualization, covering issues of cloud storage, storage tiering, and deduplication; discusses software-defined networking for network virtualization, focusing on techniques for network optimization in data centers; reviews the qualities and benefits of hybrid clouds, that bridge private and public cloud environments; investigates the security management of a software-defined data center, and proposes a framework for managing hybrid IT infrastructure components; describes the management of multi-cloud environments through automated tools, and cloud brokers that aim to simplify cloud access, use and composition; covers cloud orchestration for automating application integration, testing, infrastructure provisioning, software deployment, configuration, and delivery. This comprehensive work is an essential reference for all practitioners involved with software-defined data center technologies, hybrid clouds, cloud service management, cloud-based analytics, and cloud-based software engineering.

Cloud Computing: Theory and Practice provides students and IT professionals with an in-depth analysis of the cloud from the ground up. The third edition updates content throughout the book while retaining the popular features and organization of the second edition. After an introduction to network-centric computing and network-centric content in Chapter One, the book is organized into four sections. Section One reviews basic concepts of concurrency and parallel and distributed systems. Section Two presents such critical components of the cloud ecosystem as cloud service providers, cloud access, cloud data storage, and cloud hardware and software. Section Three covers cloud applications and cloud security, while Section Four presents research topics in cloud computing. Specific topics covered include resource virtualization, resource management and scheduling, and advanced topics like the impact of scale on efficiency, cloud scheduling subject to deadlines, alternative cloud architectures, and vehicular clouds. An included glossary covers terms grouped in several categories, from general to services, virtualization, desirable attributes and security. Includes updated content throughout chapters on concurrency, cloud hardware and software, challenges posed by big data and mobile applications and advanced topics Expanded appendix that presents several cloud computing projects Presents more than 400 references in the text, including recent research results in several areas related to cloud computing

Essentials of Cloud Computing

Cloud Computing

Theory and Practice

First International Conference, CloudComp 2009, Munich, Germany, October 19-21, 2009, Revised Selected Papers

This practically-focused reference presents a comprehensive overview of the state of the art in Cloud Computing, and examines the potential for future Cloud and Cloud-related technologies to address specific industrial and research challenges. This new edition explores both established and emergent principles, techniques, protocols and algorithms involved with the design, development, and management of Cloud-based systems. The text reviews a range of applications and methods for linking Clouds, undertaking data management and scientific data analysis, and addressing requirements both of data analysis and of management of large scale and complex systems. This new edition also extends into the emergent next generation of mobile telecommunications, relating network function virtualization and mobile edge Cloud Computing, as supports Smart Grids and Smart Cities. As with the first edition, emphasis is placed on the four quality-of-service cornerstones of efficiency, scalability, robustness, and security.

*This overview of cloud computing in a "self-teaching" format, contains state-of-the-art chapters with tips and insights about cloud computing, its architecture, applications, information on security and privacy, and numerous case studies. It includes questions for discussion and "Cloud Computing Lab Experiments" to help in mastering its complex services and technologies. Recent research shows that cloud computing will be worth billions of dollars in new investments. Organizations are flocking to the cloud services to benefit from the elasticity, self-services, resource abundance, ubiquity, responsiveness, and cost efficiencies that it offers. Many government and private universities have already migrated to the cloud. The next wave in computing technology—expected to usher in a new era—will be based on cloud computing. Features: * Explores the basic advancements in the field of cloud computing * Offers a practical, self-teaching approach with numerous case studies and lab experiments on installation, evaluation, security, and more * Includes material on ESXi, MS AZURE, EucaLypTus, and more*

The ubiquity of technology has not only brought the need for computer knowledge to every aspect of the modern business world; it has also increased our need to safely store the data we are now creating at a rate never experienced before. Delivery and Adoption of Cloud Computing Services in Contemporary Organizations brings together the best practices for storing massive amounts of data. Highlighting ways cloud services can work effectively in production and in real time, this book is an essential reference source for professionals and academics of various disciplines, such as computer science, consulting, information technology, information and communication sciences, healthcare, and finance. This reader-friendly textbook presents a comprehensive overview of the essential aspects of cloud computing, from the origin of the field to the latest developments. Rather than merely discussing the cloud paradigm in isolation, the text also examines how cloud computing can work collaboratively with other computing models to meet the needs of evolving computing trends. This multi-dimensional approach encompasses the challenges of fulfilling the storage requirements of big data, the use of the cloud as a remote server for Internet of Things and sensor networks, and an investigation of how cloud computing is interlinked with edge, fog and mist computing, among other illuminating perspectives. Topics and features: includes learning objectives, motivating questions, and self-test exercises in every chapter; presents an introduction to the underlying concepts, fundamental features, and key technological foundations of cloud computing; examines how enterprise networking and cloud networking can work together to achieve business goals; reviews the different types of cloud storage available to address the evolution of the data and the need for digitization; discusses the challenges and approaches to implementing cloud computing, and the hot topic of cloud management; highlights the value of cloud brokerage capabilities, and explains the importance of cloud orchestration in multi-cloud environments; describes the details of cloud migration, the crucial role of monitoring in optimizing the cloud, and the basics of disaster recovery using cloud infrastructure. This technically rigorous yet simple-to-follow textbook is an ideal resource for graduate courses on cloud computing. Professional software developers and cloud architects will also find the work to be an invaluable reference.

Grids, Clouds and Virtualization

A Solutions View

From the Desktop to the Enterprise

Handbook of Cloud Computing

Principles, Systems and Applications

Despite the buzz surrounding the cloud computing, only a small percentage of organizations have actually deployed this new style of IT—so far. If you're planning your long-term cloud strategy, this practical book provides insider knowledge and actionable real-world lessons regarding planning, design, operations, security, and application transformation. This book teaches business and technology managers how to transition their organization's traditional IT to cloud computing. Rather than yet another book trying to sell or convince readers on the benefits of clouds, this book provides guidance, lessons learned, and best practices on how to design, deploy, operate, and secure an enterprise cloud based on real-world experience. Author James Bond provides useful guidance and best-practice checklists based on his field experience with real customers and cloud providers. You'll view cloud services from the perspective of a consumer and as an owner/operator of an enterprise private or hybrid cloud, and learn valuable lessons from successful and less-than-successful organization use-case scenarios. This is the information every CIO needs in order to make the business and technical decisions to finally execute on their journey to cloud computing. Get updated trends and definitions in cloud computing, deployment models, and for building or buying cloud services Discover challenges in cloud operations and management not foreseen by early adopters Use real-world lessons to plan and build an enterprise private or hybrid cloud Learn how to assess, port, and migrate legacy applications to the cloud Identify security threats and vulnerabilities unique to the cloud Employ a cloud management system for your enterprise (private or multi-provider hybrid) cloud ecosystem Understand the challenges for becoming an IT service broker leveraging the power of the cloud

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.

Operational and Management Technologies and Tools

Communications and Multimedia Security

Cloud Computing: Concepts and Technology

Cloud Computing For Dummies

Encyclopedia of Cloud Computing