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Zaigham Mahmood  
Editor

# Continued Rise of the Cloud

Advances and Trends in Cloud Computing

 Springer

*Editor*

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*To  
Eyaad Imran Rashid Khan:  
Happy 1<sup>st</sup> Birthday*

# Preface

## Overview

Cloud Computing is an attractive paradigm that allows consumers to self-provision cloud-based resources, application services, development platforms, and virtualized infrastructures. The benefits associated with the cloud paradigm are enormous, and although there still are numerous inherent issues, the newness is disappearing and the hype is turning into reality. With time, cloud consumers are becoming more knowledgeable and beginning to dictate what they require. Cloud providers are learning from experiences of the past few years and beginning to provide what consumers actually need. Robust new technologies and methodologies are appearing and existing technologies are becoming mature and useable. Standards organizations are developing the necessary controls and beginning to enforce them for the benefit of all. Other agencies and cloud-related industries are also appearing to provide specialist services to support cloud providers as well as cloud consumers.

Alongside this, researchers and practitioners are coming up with strategies to resolve any issues that previously existed. New areas being investigated include: cloud security, interoperability, service level agreements, identity and access management, cloud governance, big data, data analytics, and cloud applications in other subject areas and different walks of life. New frameworks and methodologies are being developed and further refined for construction, deployment, and delivery of cloud services and environments to ensure that: the software developed is scalable and suitable for virtualized distributed environments; the deployment of platforms is secure and exhibits the in-built characteristic of multi-tenancy; and the new breed of security threats that now exist due to the shared trust boundaries are, at least, minimized.

This book, *Continued Rise of the Cloud: Advances and Trends in Cloud Computing*, aims to capture the state of the art and present discussion and guidance on the current advances and trends in the emerging cloud paradigm. In this text, 36 researchers and practitioners from around the world have presented latest research developments, current trends, state of the art reports, case studies, and suggestions for further development of the cloud computing paradigm.

## Objectives

The aim of this text is to present the current research and future trends in the development and use of methodologies, frameworks, and the latest technologies relating to Cloud Computing. The key objectives include:

- Capturing the state of the art in cloud technologies, infrastructures, service delivery and deployment models
- Analyzing the relevant theoretical frameworks, practical approaches and methodologies currently in use
- Discussing the latest advances, current trends and future directions in the cloud computing paradigm
- Providing guidance and best practices for development of cloud-based services and infrastructures
- In general, advancing the understanding of the emerging new methodologies relevant to the cloud paradigm

## Organization

There are 15 chapters in *Continued Rise of the Cloud: Advances and Trends in Cloud Computing*. These are organized in five parts, as follows:

- Part I: *Access Control Mechanisms and Cloud Security*. This section has a focus on security and access control mechanisms for cloud environments. There are three chapters. The first chapter looks into the security issues of GPU clouds. The other two contributions present access control strategies focusing on taxonomy, classification, impact and implications of such mechanisms.
- Part II: *Standards, Brokerage Services and Certification*. This comprises three chapters. The first chapter evaluates standards for Open Cloud environment whereas the second contribution analyzes the role of brokerage services in Inter-Cloud environments. The third chapter in this section discusses the role of certification for cloud adoption especially for small-to-medium sized enterprises.
- Part III: *Frameworks for ERP, Big Data and Interoperability*: There are three chapters in this part that focus on frameworks and strategies. The first chapter presents an evaluation of cloud ERP. The second contribution suggests a framework for the implementation of Big Data Science. The final chapter also presents a framework for Cloud Interoperability based on compliance and conformance.
- Part IV: *Management, Governance and Capability Assessment*. This section presents contributions on cloud governance. The first chapter surveys the existing elasticity management solutions. The second chapter presents a discussion on cloud management vs cloud governance. The last contribution of this part presents a framework for the development of a cloud service capability assessment model.
- Part V: *Applications in Education and Other Scenarios*. This is the last section of the book, comprising three chapters. The first two contributions present

cloud applications in higher education: the first chapter focusing on the use of knowledge-as-a-service in the provision of education and the other focusing on cloud-based e-learning for students with disabilities. The final contribution presents application scenarios suitable for cloud adoption.

## Target Audiences

The current volume is a reference text aimed to support a number of potential audiences, including the following:

- *Enterprise architects, business analysts and software developers* who wish to adopt the newer approaches to developing and deploying cloud-based services and infrastructures.
- *IT infrastructure managers and business leaders* who need to have a clear understanding and knowledge of the current advances and trends relating to the newer methodologies and frameworks in the context of cloud paradigm.
- *Students and lecturers* of cloud computing who have an interest in further enhancing the knowledge of the cloud related technologies, mechanisms and frameworks.
- *Researchers* in this field who need to have the up to date knowledge of the current practice, mechanisms and frameworks relevant to the cloud paradigm to further develop the same.



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