Lecture Notes in Networks and Systems 103

Harvinder Singh Saini
Rishi Sayal
Rajkumar Buyya
Govardhan Aliseri *Editors*

Innovations in Computer Science and Engineering

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Preface

This volume contains 70 papers that were presented at the Seventh International Conference on Innovations in Computer Science and Engineering (ICICSE-2019) held during 16–17 August 2019 at Guru Nanak Institutions, Hyderabad, India, in collaboration with Computer Society of India (CSI) and funding from Council of Scientific and Industrial Research (CSIR).

The aim of this conference is to provide an international forum that hubs together the researchers, scientists, academicians, corporate professionals and technically sound students from all over the world under a roof to make it as a phenomenal, informative and interactive session which is acutely needed to pave the way to promote research advancements in the field of computer science and engineering.

ICICSE-2019 received more than five hundred research papers from various sub-fields of computer science and engineering. Each submitted paper was meticulously reviewed by our review committee consisting of senior academicians, industry professionals and professors from premier institutions and universities.

This conference was inaugurated and attended by top dignitaries such as Dr. A. K. Nayak, Fellow and President, CSI, India; Dr. Govardhan Aliseri, Professor and Rector JNTUCEH, Hyderabad; Dr. Vijanth Sagayan Asirvadam, Director of Institute of Autonomous System, Universiti Teknologi, Petronas, Malaysia; Mr. G. Rama Seshagiri, Senior Principal Scientist, Head—IT Group, CSIR–NGRI, Hyderabad; Mr. Meka Venkata Chalapathy, Senior Director and Talent Management Head, Virtusa, Hyderabad; Mr. Dhrumil Sorathia, COO, Multiplier Solutions, Hyderabad; Mr. K. Mohan Raidu, Chairman, Div VIII, CSI; Dr. D. D. Sarma, Fellow CSI, Recipient LTA Award, CSI, Fellow A.P. and Telangana Academics of Sciences; Mr. Suresh Babu, Vice President, Information Technology and International Cooperation, Linyi Top Network Company, Shandong, China; and Mr. Huang Liming, Manager and Co-Interpreter of International Cooperation, Linyi Top Network Company, Shandong, China.

The technical sessions of this conference were chaired by eminent professors, Dr. P. Swetha, Department of Computer Science and Engineering, JNTUH College of Engineering Jagtial, Telangana; Dr. T. Arumuga Maria Devi, Centre for

Information Technology and Engineering, Manonmaniam Sundaranar University, Tamil Nadu; and Dr. C. N. S. Vinoth Kumar, School of Computing, SRM Institute of Science and Technology, Kattankulathur, Chennai.

Pre-conference tutorial sessions were conducted for two days during 9–10 August 2019 on cutting-edge technologies such as knowledge representation and expert systems, social network analysis, development of smart grid towards smart city perspective, and augmented reality, and the invited speakers were Dr. Parthiban Natarajan, Professor, Department of CSE, SRM Institute of Science and Technology, Chennai, India; Dr. Srinivas Padmanabhuni, Co-Founder, Tarah Technologies, Associate Vice President Research at Infosys, India, Dr. Albert Alexander, Associate Professor, Department of EEE, Kongu Engineering College, India; and Dr. Vigneshwaran T., Founder and CEO, Nanda Infotech, Coimbatore, India, respectively.

The organizing committee of ICICSE-2019 takes the opportunity to thank the invited speakers, session chairs and reviewers for their excellent support in making this ICICSE-2019 a grand success.

The quality of the research papers is a courtesy from respective authors and reviewers to come up with the desired level of excellence. We are indebted to the programme committee members and external reviewers in producing the best-quality research papers in a short span of time. We also thank CSI delegates and CSIR, for their valuable suggestions and funding in making this event a grand success.

Hyderabad, India — Harvinder Singh Saini
Hyderabad, India — Rishi Sayal
Hyderabad, India — Govardhan Aliseri
Melbourne, Australia — Rajkumar Buyya

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Dr. Rishi Sayal is an Associate Director of Guru Nanak Institutions Technical Campus. He holds a B.E. (CSE), and M.Tech. (IT), and received his Ph.D. (CSE). in Computer Science and Engineering in the field of data mining from the prestigious Mysore University of Karnataka State. He has over 27 years of experience in training, consultancy, teaching, and placements. His current areas of research interest include data mining, network security, and databases. He has published a wide number of research papers in international conferences and journals, and has received several research grants from government funding agencies. He is co-editor of various innovative journals and has convened international conferences.

Dr. Rajkumar Buyya is a Redmond Barry Distinguished Professor and Director of the Cloud Computing and Distributed Systems (CLOUDS) Laboratory at the University of Melbourne, Australia. He is also serving as the founding CEO of Manjrasoft Pvt. Ltd, a spin-off company of the University, commercializing its innovations in cloud computing. He served as a Future Fellow of the Australian Research Council from 2012 to 2016. He received a Doctor of Philosophy (Ph.D.) in Computer Science and Software Engineering from Monash University,

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Dr. Govardhan Aliseri is currently a Professor of Computer Science & Engineering, Rector of JNTUH, and a member of the executive council at Jawaharlal Nehru Technological University Hyderabad (JNTUH), India, where he also completed his Ph.D. He is a member of the editorial boards of twelve international journals. He is a member of the advisory & academic boards and technical program committees of more than 65 international and national conferences. He has published two monographs and ten book chapters.

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Survey on Cloud Computing Security

M. K. Sinchana and R. M. Savithramma

Abstract Cloud computing is considered as one of the renowned computing methods for pooling and providing various computing resources on demand basis. Cloud computing has grabbed its roots in the IT industry and has become a useful choice for small budget business and organizations. As multiple customers are sharing the same cloud, it will have many security challenges such as malicious user attack, user identity management, auditing, resource management, and integrity control. The main aim here is to provide security to the data by protecting it by unauthorized users during the time of information transmission by using different encrypting techniques such as Blowfish algorithm, RSA algorithm, secure hash algorithm 2, and message digest, on the user data in the cloud. In this paper, we present very recent techniques and algorithms proposed by various authors to secure the stored cloud data.

Keywords Cloud computing · Information security · Blowfish algorithm · Hash algorithm

1 Introduction

Cloud computing is a standard method that is found and suitable everywhere because it provides access to the collection of resources on request of the users which can be used with less interaction with the service provider and with the minimum cost. It is considered as a dominant technology because it can manage the large amount of information. Cloud computing is consistent and reliable, due to which the organizations use this infrastructure and need no necessary to build their own. It is a best method for any sized organization or business because of its cost-saving technology. It is a platform which provides computing resources as a service. The services that are based on cloud include software as a service, platform as a service, and infrastructure as a service [1]. Some of the examples of cloud computing infrastructure are Microsoft Windows Azure storage services, IBM's Blue Cloud, Amazon's EC2, Google app engine and S3, etc. [2].

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Although cloud computing has many uses, it also has some disadvantages too, and the most important is security issue. It has many security-related issues such as identity management, resource management, and integrity control and so on. In cloud computing, if any organization or user wants to store their important data, they should provide it to the utility provider. Therefore, the risk of important information going into the evil hands is high because cloud services are available and accessible by all its users. Hence, there is the most probability of misusage of confidential data or the user data may be altered intentionally by hackers or accidentally by other users. This leads to confidentiality and consistency breach.

By considering all these issues regarding the security of the data, it is considered an important concern in cloud computing. Cryptography is widely approved method for ensuring the information security. This mechanism will secure the information by changing it to the unreadable form.

There are two types of cryptographic algorithm. They are symmetric key algorithm and asymmetric key algorithm. In symmetric key algorithm, one key is used for both encryption and decryption of the data known as private key, and in asymmetric key cryptographic algorithm, two keys are used, namely private key and public key [3]. Here, public key is used for encrypting the information, and private key is used for decrypting the user information. As compared to symmetric key cryptography, asymmetric key cryptography is considered as more secure because here we use two different keys and if in case one key gets leaked cannot cause any harm to the encrypted data.

2 Related Works

Soman and Natarajan [1] proposed an enhanced hybrid data security algorithm for the cloud in order to protect the information that is present in the cloud by using the combination of SHA256, ECDSA, and AES. These methods are used for securely sending and receiving the information or data on the cloud.

Timothy and Santra [4] have proposed a new hybrid cryptography method for security by using RSA, Blowfish, and SHA-2 algorithms. Here, by combining the symmetric and asymmetric algorithm, the efficiency of the proposed system is increased, and by using SHA-2 algorithm, high security is provided to the data transmission.

Kanna and Vasudevan [2] proposed a novel identity-based hybrid encryption (RSA with ECC) to increase the security of the information. Here, the information is encrypted by sender by using the identity-based hybrid encryption algorithm.

Singh and Malhotra [3] have proposed a hybrid two-tier agent-based framework which deploys symmetric and asymmetric key algorithms in combination to provide robust security to user data in the cloud environment.

Chauhan and Gupta [5] proposed a novel parallel cryptographic algorithm where MD5 and Blowfish encryption algorithms are used in order to overcome the problems of symmetric block cryptography and hash function algorithm, which can upgrade the security.