2022 IEEE International Conference on Cloud Computing Technology and Science (**CloudCom 2022**)

Bangkok, Thailand **13 – 16 December 2022**



IEEE Catalog Number: CFP22CLU-POD **ISBN:**

978-1-6654-6368-3

Copyright © 2022 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

CFP22CLU-POD
978-1-6654-6368-3
978-1-6654-6367-6

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400 Fax: (845) 758-2633 E-mail: curran@proceedings.com Web: www.proceedings.com



2022 IEEE International Conference on Cloud Computing Technology and Science (CloudCom) **CloudCom 2022**

Table of Contents

Message from the General Co-Chairs	ix
Message from the Cloud Computing Association – CloudCom.org	x
Message from Technical Program Committee Chairs	xi
Message from the OpenIaC Workshop Chairs	xii
IEEE CloudCom 2022 Committees	xiii
IEEE CloudCom 2022 Technical Program Committee	xiv

CloudCom 2022 Papers

On Kubernetes-Aided Federated Database Systems Zheng Li (Queen's University Belfast, UK), Nicolás Saldías-Vallejos (Universidad de Concepción, Chile), María Andrea Rodríguez (Universidad de Concepción, Chile), and Austen Rainer (Queen's University Belfast, UK)
 FVMM: Fast VM Migration for Virtualization-Based Fault Tolerance using Templates
HPA: Hierarchical Placement Algorithm for Multi-cloud Microservices Applications
 Scalable Containerized Pipeline for Real-Time Big Data Analytics
A Survey on Autonomic Multi-cloud Computing

Quality of Information Matters: Recommending Web Services for Performance and Utility
A Note on the Determination of the Processing Capacity in a Multiserver Job System as a Model of Cloud Datacenters
Blockchain-Based Cross-Organizational Workflow Platform
A Survey on Infrastructure-as-Code Solutions for Cloud Development
meQ: Selecting MEC Resources by Considering Service Communication Requirements
Blockchain Empowered and Self-Sovereign Access Control System
FLOMD: Fast and Low Overhead Memory Deduplication for Edge Nodes
 Knowledge Graphs and Interoperability Techniques for Hybrid-Cloud Deployment of FaaS Applications
 NFT as a Proof of Digital Ownership-Reward System Integrated to a Secure Distributed Computing Blockchain Framework

CSM-DBEN: Container Storage Manager for Data Backup on Edge Nodes	5
A Survey on Cybersecurity Barrier Management in Process Control Environments	3
FedTeams: Towards Trust-Based and Resource-Aware Federated Learning	1
Performance Analysis of HElib on a Privacy Preserving Search for Genome Information with Fully Homomorphic Encryption Arisa Tsuji (Ochanomizu University, Japan) and Masato Oguchi (Ochanomizu University, Japan)	9
Consensus Latency of PoW Blockchains	7
Internet of Wearables: Fog Extrapolation for Reduced Data Collection and Expanded Capture Volume in Real-Time Motion Capture Edge Devices Shaun Stevens (CMKL University, Thailand), Paulo Garcia (CMKL University, Thailand), and Hyong Kim (Carnegie Mellon University, USA)	8
 Consideration of a Supercomputing System with Cloud Bursting Functionality from an Operational Perspective	4
 5GFIVer: Functional Integrity Verification for 5G Cloud-Native Network Functions	2
GPU Performance Tuning and Power Efficiency on the DGX A100 Cluster	0
A Hybrid Decision-Making Approach to Security Metrics Aggregation in Cloud Environments17 Ming Lei (Carleton University, Canada), Lianying Zhao (Carleton University, Canada), Makan Pourzandi (Ericsson Research, Canada), and Fereydoun Farrahi Moghaddam (Ericsson Research, Canada)	8

Supporting Confidential Workloads in SPIRE Eduardo Falcão (Federal University of Rio Grande do Norte, Brazil), Matteus Silva (Federal University of Campina Grande, Brazil), Ariel Luz (Federal University of Campina Grande, Brazil), and Andrey Brito (Federal University of Campina Grande, Brazil)	186
2SFGL: A Simple and Robust Protocol for Graph-Based Fraud Detection Zhirui Pan (Fudata Technology, China), Guangzhong Wang (Bank of Communications, China), Zhaoning Li (Bank of Communications, China), Lifeng Chen (Fudata Technology, China), Yang Bian (Fudata Technology, China), and Zhongyuan Lai (Fudan University, China)	194
How to Confirm Blocks in PoW Blockchains	202
Software Vulnerability Assessment: Vendor, Scanner, and User Analysis Kietthibhum Boonchuay (CMKL University, Thailand), Wachirawich Siripaktanakon (CMKL University, Thailand), Orathai Sangpetch (CMKL University, Thailand), and Akkarit Sangpetch (CMKL University, Thailand)	214
Yet Another Blockchain-Based Privacy-Friendly Social Network Lars Andreassen Jaatun (University of Stavanger, Norway), Anders Ringen (University of Stavanger, Norway), and Martin Gilje Jaatun (University of Stavanger, Norway)	222
 Privacy and Security Challenges for Autonomous Agents Dennis Biström (Arcada University of Applied Sciences, Finland), Magnus Westerlund (Arcada University of Applied Sciences, Finland), Bob Duncan (University of Aberdeen, Scotland), and Martin Gilje Jaatun (University of Stavanger, Norway; SINTEF Digital, Norway) 	230
Decentralizing Machine Learning Operations using Web3 for IoT Platforms John Wickstöm (Aalto University, Finland), Magnus Westerlund (Arcada University of Applied Sciences, Finland), and Emmanuel Raj (Relex Solutions, Finland)	238
Managing Digital Objects with Decentralised Identifiers Based on NFT-Like Schema Chunming Rong (University of Stavanger, Norway), Jiahui Geng (University of Stavanger, Norway), and Martin Gilje Jaatun (University of Stavanger, Norway)	246

Author Index 253
