

2015 IEEE 2nd International Conference on Cyber Security and Cloud Computing (CS Cloud 2015)

**New York, New York, USA
3-5 November 2015**



**IEEE Catalog Number: CFP15C21-POD
ISBN: 978-1-4673-9301-0**

**Copyright © 2015 by the Institute of Electrical and Electronic 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 publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number: CFP15C21-POD
ISBN (Print-On-Demand): 978-1-4673-9301-0

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

2015 IEEE 2nd International Conference on Cyber Security and Cloud Computing

CSCloud 2015

Table of Contents

Message from the General Chairs of IEEE CSCloud 2015.....	xii
Message from the Program Chairs of IEEE CSCloud 2015.....	xiii
Committee Members of IEEE CSCloud 2015.....	xiv
Program Committee of IEEE CSCloud 2015.....	xv
Message from the Program Chairs of SSC 2015.....	xvii
Committee Members of SSC 2015.....	xviii

The Second IEEE International Conference on Cyber Security and Cloud Computing (CSCloud 2015)

CSCloud HACC1: Heterogeneous Architecture for Cloud Computing

Efficiency-Aware Workload Optimizations of Heterogeneous Cloud Computing for Capacity Planning in Financial Industry	1
<i>Keke Gai, Zhihua Du, Meikang Qiu, and Hui Zhao</i>	
Game Theoretic Modeling to Enforce Security Information Sharing among Firms	7
<i>Deepak K. Tosh, Shamik Sengupta, Sankar Mukhopadhyay, Charles A. Kamhoua, and Kevin A. Kwiat</i>	
Enhancing Confidentiality and Privacy of Outsourced Spatial Data	13
<i>Ayesha M. Talha, Ibrahim Kamel, and Zaher Al Aghbari</i>	
Adaptive Resource Allocation Optimization in Heterogeneous Mobile Cloud Systems	19
<i>Longbin Chen, Yucong Duan, Meikang Qiu, Jian Xiong, and Keke Gai</i>	

CSCloud HACC2: Heterogeneous Architecture for Cloud Computing

Performance Metrics of Local Cloud Computing Architectures	25
<i>Travis Brummett, Pezhman Sheinidashtegol, Debadrita Sarkar, and Michael Galloway</i>	
Third-Party Auditor (TPA): A Potential Solution for Securing a Cloud Environment	31
<i>Syed Rizvi, Abdul Razaque, and Katie Cover</i>	
Design of Detecting Botnet Communication by Monitoring Direct Outbound DNS Queries	37
<i>Yong Jin, Hikaru Ichise, and Katsuyoshi Iida</i>	

An Approach to Minimize Crossings in Phylogenetic Trees	42
<i>Md Liakat Ali, Kutub Thakur, John V. Monaco, and Meikang Qiu</i>	

CSCloud TGDP: Trust Governance and Data Privacy

Privacy-Preserving Data Exfiltration Monitoring Using Homomorphic Encryption	48
<i>Kurt Rohloff</i>	
Implementing Migration-Aware Virtual Machines	54
<i>Taimur Al Said and Omer Rana</i>	
CPAV: Computationally Efficient Privacy Preserving Anonymous Authentication Scheme for Vehicular Ad Hoc Networks	62
<i>P. Vijayakumar, M. Azees, and L. Jegatha Deborah</i>	
Integral Attack on Reduced-Round Rectangle	68
<i>Haruhisa Kosuge, Hidema Tanaka, Keisuke Iwai, and Takakazu Kurokawa</i>	

CSCloud TPSD: Threats Predictions and Smart Data

Anti-Counterfeit Scheme Using Monte Carlo Simulation for E-commerce in Cloud Systems	74
<i>Keke Gai, Meikang Qiu, Hui Zhao, and Wenyun Dai</i>	
Using ELM Techniques to Predict Data Centre VM Requests	80
<i>Salam Ismaeel and Ali Miri</i>	
Search Engine: A Hidden Power for Virus Propagation in Community Networks	87
<i>Jia Yang, Cai Fu, Deliang Xu, Lansheng Han, and Xiao-Yang Liu</i>	
The Software Design of Car Low-Speed Intelligent Braking System	93
<i>Bao Fanbiao, Huang Baoshan, Li Bing, and Jiao Yonghe</i>	

CSCloud THT: Tele-health Track

Ontology-Based Knowledge Representation for Secure Self-Diagnosis in Patient-Centered Telehealth with Cloud Systems	98
<i>Keke Gai, Meikang Qiu, Saravanan Jayaraman, and Lixin Tao</i>	
Access Control for Multi-tenancy in Cloud-Based Health Information Systems	104
<i>Mohd Anwar and Ashiq Imran</i>	
Secure and Efficient Personal Health Record Scheme Using Attribute-Based Encryption	111
<i>Kai Fan, Nana Huang, Yue Wang, Hui Li, and Yintang Yang</i>	
DOGCP: A Domain-Oriented Government Cloud Platform Based on PaaS	115
<i>Yuanming Zhang, Kuan Ni, Jiawei Lu, Jun Xu, and Gang Xiao</i>	

CSCloud DCCS: Distributed Computing and Cyber Security

An SDN-Based Fabric for Flexible Data-Center Networks	121
<i>Longbin Chen, Meikang Qiu, and Jian Xiong</i>	

PERM-GUARD: Authenticating the Validity of Flow Rules in Software Defined Networking	127
--	-----

Mengmeng Wang, Jianwei Liu, Jie Chen, Xiao liu, and Jian Mao

CLMRS: Designing Cross-LAN Media Resources Sharing Based on DLNA	133
--	-----

Fei Gu, Jianwei Niu, Zhenxue He, Meikang Qiu, and Cuijiao Fu

Smart Grid DNP3 Vulnerability Analysis and Experimentation	141
--	-----

Ihab Darwish, Obinna Igbe, Orhan Celebi, Tarek Saadawi, and Joseph Soryal

CSCloud SWCCC1: Services and Workflows in the Cyber-Space and Cloud Computing

Context Awareness through Reasoning on Private Analysis for Android Application	148
---	-----

Hongmu Han, Ruixuan Li, Jinwei Hu, and Meikang Qiu

Enforcing Correct Behavior without Trust in Cloud Key-Value Databases	157
---	-----

Andrea Andreoli, Luca Ferretti, Mirco Marchetti, and Michele Colajanni

Class-Chord: Efficient Messages to Classes of Nodes in Chord	165
--	-----

Dan Fleck, Fengwei Zhang, Sharath Hiremagalore, Stephen Reese, and Liam McGhee

Maintainable Mobile Model Using Pre-Cache Technology for High Performance Android System	175
--	-----

Hui Zhao, Meikang Qiu, Keke Gai, Jie Li, and Xin He

CSCloud SWCCC2: Services and Workflows in the Cyber-Space and Cloud Computing

"Do You Want to Install an Update of This Application?" A Rigorous Analysis of Updated Android Applications	181
---	-----

Ahmet Ilhan Aysan and Sevil Sen

Threshold Attribute-Based Signcryption in Standard Model	187
--	-----

Haibin Zheng, Jing Qin, Jiankun Hu, and Qianhong Wu

Towards Trustworthy Participants in Social Participatory Networks	194
---	-----

Guangquan Xu, Bin Liu, Yuanyuan Ren, Runhe Huang, Gaoxu Zhang, Zhiyong Feng, and Xiaohong Li

Detection and Identification of Android Malware Based on Information Flow Monitoring	200
--	-----

Radoniaina Andriatsimandefitra and Valérie Viet Triem Tong

CSCloud MESA: Mobile Embedded Systems and Algorithms

Intelligent Traffic Light Model Based on Grey-Markov Model and Improved Ant Colony Optimization for Dynamic Route Guidance	204
--	-----

Jiaxu Zhao, Zhide Chen, and Yali Zeng

Designing ARINC653 Partition Constrained Scheduling for Secure Real Time Embedded Avionics	213
--	-----

Xiang Tao, Yongxin Zhu, Yishu Mao, Han Song, Mengyun Liu, Xinyi Liu, Weiguang Sheng, and Weiwei Shi

Energy Optimization of Air-Based Information Network with Guaranteed Security Protection	218
<i>Xiao Liu, Meikang Qiu, Xiaodong Wang, Weiran Liu, and Kaiquan Cai</i>	
Detecting Kernel Vulnerabilities During the Development Phase	224
<i>Nezer J. Zaidenberg and Eviatar Khen</i>	

CSCloud PPCCC: Privacy Preserve in the Cyber-Space and Cloud Computing

Feature Analysis of Important Nodes in Microblog	231
<i>Yang Yang, Hui Xu, Yanan Liu, Zhongwei Li, Weishan Zhang, and Xin Liu</i>	
An Uneven Distributed System for Dynamic Taint Analysis Framework	237
<i>Xuefei Wang, Hengtai Ma, Ke Yang, and Hongliang Liang</i>	
Survey on Privacy Protection of Android Devices	241
<i>Hongliang Liang, Dongyang Wu, Jiuyun Xu, and Hengtai Ma</i>	
Small-Scale Cyber Security	247
<i>Emma Osborn and Andrew Simpson</i>	

CSCloud EDS: Encryption-Decryption Scheme

A Low Storage Phase Search Scheme Based on Bloom Filters for Encrypted Cloud Services	253
<i>Hoi Ting Poon and Ali Miri</i>	
A Three-Party Optimistic Certified Email Protocol Using Verifiably Encrypted Signature Scheme for Line Topology	260
<i>Yoshiaki Shiraishi, Masami Mohri, Hitoshi Miyazaki, and Masakatu Morii</i>	
Efficiently Managing Encrypted Data in Cloud Databases	266
<i>Osama M Ben Omran and Brajendra Panda</i>	
Meta Meta-Analytics for Risk Forecast Using Big Data Meta-Regression in Financial Industry	272
<i>Hevel Jean-Baptiste, Meikang Qiu, Keke Gai, and Lixin Tao</i>	

CSCloud SMFP1: Security Model, Framework, and Paradigm

City of White Plains Parking App: Case Study of a Smart City Web Application	278
<i>Ari Butowsky, Keke Gai, Michael Coakley, Meikang Qiu, and Charles C. Tappert</i>	
A Simulation Modeling Method Based on Petri Net	283
<i>Yu Huang, Xuanzheng Hu, Guangxian Lv, and Renfan Yang</i>	
A Novel Anomaly Detection Approach for Mitigating Web-Based Attacks Against Clouds	289
<i>Simin Zhang, Bo Li, Jianxin Li, Mingming Zhang, and Yang Chen</i>	
Detection of Malware and Kernel-Level Rootkits in Cloud Computing Environments	295
<i>Thu Yein Win, Huaglory Tianfield, and Quentin Mair</i>	

CSCloud SMFP2: Security Model, Framework, and Paradigm

Understanding Model Risk Management — Model Rationalization in Financial Industry	301
<i>Hevel Jean-Baptiste, Lixin Tao, Meikang Qiu, and Keke Gai</i>	
An Investigation on Cyber Security Threats and Security Models	307
<i>Kutub Thakur, Meikang Qiu, Keke Gai, and Md Liakat Ali</i>	
Model Risk Management Systems—Back-End, Middleware, Front-End and Analytics	312
<i>Hevel Jean-Baptiste, Meikang Qiu, Keke Gai, and Lixin Tao</i>	
A Lightweight Detection of the RFID Unauthorized Reading Using RF Scanners	317
<i>Wenqing Zhang, Shijie Zhou, Jiaqing Luo, Hongrong Cheng, and Yongjian Liao</i>	

CSCloud MLCS: Machine Learning in Cyber Security

A Reliable Broadcasting Algorithm in Locally Twisted Cubes	323
<i>Baolei Cheng, Jianxi Fan, Dajin Wang, and Jiwen Yang</i>	
An Extreme Learning Machine (ELM) Predictor for Electric Arc Furnaces' <i>v-i</i> Characteristics	329
<i>Salam Ismaeel, Ali Miri, Alireza Sadeghian, and Dharmendra Chourishi</i>	
Remote Attestation of Software and Execution-Environment in Modern Machines	335
<i>Michael Kiperberg, Amit Resh, and Nezer J. Zaidenberg</i>	
Face Recognition with Environment Tolerance on a Mobile Device	342
<i>Philip J. Riesch, Xiaojiang Du, Haibin Ling, and Michael J. Mayhew</i>	

CSCloud AFD: Authentication Framework and Detection

Integer Data Zero-Watermark Assisted System Calls Abstraction and Normalization for Host Based Anomaly Detection Systems	349
<i>Waqas Haider, Jiankun Hu, Xinghuo Yu, and Yi Xie</i>	
Next Generation of Impersonator Bots: Mimicking Human Browsing on Previously Unvisited Sites	356
<i>Yang Yang, Natalija Vlajic, and U. T. Nguyen</i>	
SMM-Based Hypervisor Integrity Measurement	362
<i>William Augusto Rodrigues de Souza and Allan Tomlinson</i>	
QRToken: Unifying Authentication Framework to Protect User Online Identity	368
<i>Fei Xu, Sheng Han, Ying Wang, Jian Zhang, and Yong Li</i>	

CSCloud NSCM1: New Secure Cloud Mechanism

Split-System: The New Frontier of Cloud Computing	374
<i>Bharat S. Rawal, Ramesh K. Karne, and Quiang Duan</i>	
Cyber-Threats Information Sharing in Cloud Computing: A Game Theoretic Approach	382
<i>Charles Kamhoua, Andrew Martin, Deepak K. Tosh, Kevin A. Kwiat, Chad Heitzenrater, and Shamik Sengupta</i>	

Multi-step Attack Pattern Detection on Normalized Event Logs	390
--	-----

David Jaeger, Martin Ussath, Feng Cheng, and Christoph Meinel

Towards an Early Warning System for Network Attacks Using Bayesian Inference	399
--	-----

Harsha Kumara Kalutarage, Chonho Lee, Siraj Ahmed Shaikh, and Francis Lee Bu Sung

CSCloud NSCM2: New Secure Cloud Mechanism

Towards Secure and Dependable Cloud Storage Based on User-Defined Workflows	405
---	-----

Jedidiah Yanez-Sierra, Arturo Diaz-Perez, Victor Sosa-Sosa, and J. L. Gonzalez

Combination in Advance Batch Multi-exponentiation on Elliptic Curve	411
---	-----

Rui Tao, Jianwei Liu, Hang Su, Yang Sun, and Xiao Liu

MR-Graph: A Customizable GPU MapReduce	417
--	-----

Zhi Qiao, Shuwen Liang, Hai Jiang, and Song Fu

Safe Internet Browsing Using a Transparent Virtual Browser	423
--	-----

Jeffrey Bickford and Paul Giura

CSCloud SNSCI: Sensor Network Security and Cyber Intelligence

Improved Ant Colony Algorithm for Finding the Maximum Clique in Social Network	433
--	-----

Suqi Zhang, Yongfen Dong, Jun Yin, and Jingjin Guo

Computational Security Evaluation of Light-Weight Block Cipher Against Integral Attack by GPGPU	439
--	-----

Haruhisa Kosuge, Hidema Tanaka, Keisuke Iwai, and Takakazu Kurokawa

Website Forgery: Understanding Phishing Attacks and Nontechnical Countermeasures	445
--	-----

Ibrahim Waziri Jr.

Security Issues in WSNs with Cooperative Communication	451
--	-----

Thaier Hayajneh, Tao Zhang, and Bassam J Mohd

CSCloud CSMCC: Cloud Security and Mobile Cloud Computing

Tunable Performance and Consistency Tradeoffs for Geographically Replicated Cloud Services (COLOR)	457
---	-----

Wenbo Zhu and Murray Woodside

Detecting Malware for Android Platform: An SVM-Based Approach	464
---	-----

Wenjia Li, Jigang Ge, and Guqian Dai

Open Source Cloud Management Platforms: A Review	470
--	-----

Salam Ismaeel, Ali Miri, Dharmendra Chourishi, and S. M. Reza Dibaj

Two-Way Graphic Password for Mobile User Authentication	476
---	-----

Ming Jiang, Ai He, Kuangyu Wang, and Zhengyi Le

CSCloud CSA: Cyber Security for Applications

Ability and Hurdle to Provide Banking Online Services: A Case Study of Banking Employees in Nigeria	482
<i>Joseph Funsho Omonaiye, V. V. Madhavi Lalitha, Habib Ullah Khan, Sheila D. Fournier-Bonilla, and Rajvir Singh</i>	
Forward Secure On-device Encryption Scheme Withstanding Cold Boot Attack	488
<i>S. Sree Vivek and Rajkumar Ramasamy</i>	
Extending OWL to Support Custom Relations	494
<i>Khagesh Patel, Ishaan Dube, Lixin Tao, and Ning Jiang</i>	
Improved Differential Characteristic Searching Methods	500
<i>Jiageng Chen, Atsuko Miyaji, Chunhua Su, and Jesen Teh</i>	

CSCloud WiP: WiP/Poster

PhD Forum: A System Identification Approach to Monitoring Network Traffic Security	509
<i>Quentin Mayo, Renee Bryce, and Ram Dantu</i>	
Handling System Overload Resulting from DDoS Attacks and Flash Crowd Events	512
<i>Zaid Al-Ali, Basheer Al-Duwairi, and Ahmad T. Al-Hammouri</i>	
Predicting Vulnerability Exploits in the Wild	513
<i>Michel Edkrantz, Staffan Truvé, and Alan Said</i>	
An Efficiency Optimization Scheme for the On-the-Fly Statistical Randomness Test	515
<i>Tianyu Chen, Yuan Ma, Jingqiang Lin, Zhan Wang, and Jiwu Jing</i>	

IEEE International Symposium of Smart Cloud (SSC 2015)

A Strategy to Improve the Efficiency of I/O Intensive Application in Cloud Computing Environment	518
<i>Lujin You, Junjie Peng, Ming Chen, and Meikang Qiu</i>	
Research on Application Classification Method in Cloud Computing Environment	524
<i>Jinbao Chen, Junjie Peng, Xiaofei Zhi, and Meikang Qiu</i>	
A Dependable Service Path Searching Method in Distributed Virtualized Environment Using Adaptive Bonus-Penalty Micro-Canonical Annealing	530
<i>Huiqiang Wang, Shichen Zou, Junyu Lin, Guangsheng Feng, and Hongwu Lv</i>	
Seagull — A Real-Time Coflow Scheduling System	540
<i>Zhouwang Fu, Tao Song, Sheng Wang, Fuzong Wang, and Zhengwei Qi</i>	
Author Index	546