

# **2022 IEEE 11th International Conference on Cloud Networking (CloudNet 2022)**

**Paris, France  
7-10 November 2022**



**IEEE Catalog Number: CFP2268T-POD  
ISBN: 978-1-6654-8628-6**

**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.***

IEEE Catalog Number:	CFP2268T-POD
ISBN (Print-On-Demand):	978-1-6654-8628-6
ISBN (Online):	978-1-6654-8627-9
ISSN:	2374-3239

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# Table of Content

Table of Content	III
Message from the Chairs	VII
Technical Program	IX
Author Index	XVIII
Awards	XXV
Organizing Committee	XXVI
Steering Committee	XXXIII
Technical Program Committee (TPC)	XXXIV
Additional Reviewers	XXXVI
Pedro Casas, Nikolas Wehner, Sarah Wassermann, Michael Seufert, Fingerprinting Webpages and Smartphone Apps from Encrypted Network Traffic with WebScanner	p. 1
Mathieu Champion, Marc Dacier, Elisa Chiapponi, ImMuNE: Improved Multilateration in Noisy Environments	p. 10
Ryohei Banno, Koki Osawa, Acceleration of MQTT-SN protocol using P4	p. 16
Rei Nakagawa, Satoshi Ohzahata, Ryo Yamamoto, Improving Fairness for QoE of Adaptive Video Streaming over ICN	p. 22

Laiza De Lara, Francesca Fossati, Stephane Rovedakis, Robust Resource Allocation Against Controller Failures in Network Slice Provisioning	p. 28
Saurav Chakraborty, Krishna Sivalingam, Virtual Network Embedding using a Federated DRL Approach	p. 34
Mengfei Zhu, Eiji Oki, Resource Allocation in Multiple Backup Modes under Reliability Guarantee with Workload-Dependent Failure Probability	p. 40
Juan Vanerio, Stefan Schmid, Morten Schou, Jiri Srba, MPLS-Kit: An MPLS Data Plane Toolkit	p. 49
Nicklas S. Johansen, Lasse B. Kaer, Andreas L. Madsen, Kristian Ø Nielsen, Stefan Schmid, Jiri Srba, Rasmus G. Tollund, FBR: Dynamic Memory-Aware Fast Rerouting	p. 55
Opeoluwa Babasanmi, Josiah Chavula, Measuring Cloud Latency in Africa	p. 61
Junji Takemasa, Yuki Koizumi, Toru Hasegawa, Terabytes and Terabits/s Packet Caching in ICN Routers using Programmable Switches	p. 67
Fabiano Bhering, Diego Passos, Célio Vinicius Neves de Albuquerque, Katia Obraczka, Efficient Multipath Selection for IoT Video Transmission	p. 73
Marios Touloupou, Evgenia Kapassa, Stamatia Rizou, Cloud Orchestration for Optimized Computing Efficiency: The Case of Wind Resource Modelling	p. 79
Adrien Gausseran, Redha Alliche, Hicham Lesfari, Ramon Aparicio-Pardo, Frederic Giroire, Joanna Moulierac, Reconfiguring Network Slices at the Best Time With Deep Reinforcement Learning	p. 85
Konstantinos Antonopoulos, Dimitrios Ringas, Eleni Christopoulou, Georgios Keramidas, Christos Antonopoulos, Nikolaos Voros, NS3SaaS: Cloud-based "Network Simulator as a Service" with customisable resource scheduling	p. 93
Daniel Fraunholz, Richard Schörghofer-Vrinssen, Hartmut Koenig, Daniel Reti, Cutting Edge: Privacy Analysis of the ETSI MEC APIs and the Potential Vulnerabilities	p. 101
Semih Ince, David Espes, Guy Gogniat, Renaud Santoro, Julien Lallet, Token-based authentication and access delegation for HW-accelerated telco cloud solution	p. 109
Marinos Dimolianis, Dimitrios K. Kalogeras, Nikos Kostopoulos, Vasilis Maglaris, DDoS Attack Detection via Privacy-aware Federated Learning and Collaborative Mitigation in Multi-domain Cyber Infrastructures	p. 118
Paulo Gonçalves Rocha, Alisson Souza, Francisco Airton Silva, Paulo A. L. Rego, Decision Algorithm for Computational Offloading in Vehicular Fog Computing with Pedestrians	p. 126
Naoya Kitagawa, Atsuko Takefusa, Kento Aida, Development of a Secure Data Sharing Mechanism for IoT Application Systems	p. 131

Ahmed ElKenawy, Sherif Aly, An Enhanced Cloud-Native Deep Learning Pipeline for Network Traffic Classification	p. 136
Line M. P. Larsen, Henrik L. Christiansen, Sarah Ruepp, Michael S. Berger, Deployment Guidelines for Cloud-RAN in Future Mobile Networks	p. 141
Guilherme Lecker Ricardo, Amal Benhamiche, Nancy Perrot, Yannick Carlinet, Latency-Constrained Task Distribution in Multi-Access Edge Computing Systems	p. 150
Ayeh Mahjoubi, Karl-Johan Grinnemo, Javid Taheri, An Efficient Simulated Annealing-based Task Scheduling Technique for Task Offloading in a Mobile Edge Architecture	p. 159
Wael Jaafar, Koutoua Jean Roméo Beyara, Imen Aouini, Jihene Ben Abderrazak, Halim Yanikomeroglu, On the Deployment of Blockchain in Edge Computing Wireless Networks	p. 168
Ilias Syrigos, Dimitris Syrivelis, Thanasis Korakis, On the Implementation of a Software-Defined Memory Control Plane for Disaggregated Datacenters	p. 177
Dávid Balla, Markosz Maliosz, Csaba Simon, Predictable Open Source FaaS Function Chains	p. 186
Merlijn Sebrechts, Tim Ramlot, Sander Borny, Tom Goethals, Bruno Volckaert, Filip De Turck, Adapting Kubernetes controllers to the edge: on-demand control planes using Wasm and WASI	p. 195
Hadi Sehat, Daniel E. Lucani, Elena Pagnin, Bifrost: Secure, Scalable and Efficient File Sharing System Using Dual Deduplication	p. 203
Samuel M. A. Araújo, Fernanda S. H. de Souza, Geraldo R. Mateus, A demand aware strategy for a machine learning approach to VNF-PC problem	p. 211
Koki Horita, Bin Yang, Thomas Carette, Masanobu Jimbo, Akihiro Nakao, Optimal Network Selection Method Using Federated Learning to Achieve Large-Scale Learning While Preserving Privacy	p. 220
Mahdi Sharara, Turgay Pamuklu, Sahar Hoteit, Véronique Vèque, Melike Erol-Kantarci, Policy-Gradient-Based Reinforcement Learning for Computing Resources Allocation in O-RAN	p. 229
Hoa X. Nguyen, Shaoshu Zhu, Mingming Liu, Graph-PHPA: Graph-based Proactive Horizontal Pod Autoscaling for Microservices using LSTM-GNN	p. 237
Rahul Verma, Krishna M. Sivalingam, Federated Learning approach for Auto-scaling of Virtual Network Function resource allocation in 5G-and-Beyond Networks	p. 242
Christian Morup, Anders Lindskov Kloborg, Daniel E. Lucani, Extreme Bitmapping: Efficiently Sorting Data for Cloud Compression	p. 247
Masoud Taghavian, Yassine Hadjadj-Aoul, Geraldine Texier, Philippe Bertin, NSPlacer: A Tool for Evaluating Service Placement Algorithms in Post-5G Networks	p. 252



Homa Esfahanizadeh, Alejandro Cohen, Muriel Médard, Shlomo Shamai, Distributed Computations with Layered Resolution	p. 257
Wendlasida Ouedraogo, Alessandro Di Stefano, Andrea Araldo, Antonella Di Stefano, MORA on the Edge: a testbed of Multiple Option Resource Allocation	p. 262
Mohamed Oulaaffart, Rémi Badonnel, Olivier Festor, CMSec: A Vulnerability Prevention Tool for Supporting Migrations in Cloud Composite Services	p. 267
Ricardo Carvalho, Mário Antunes, João Paulo Barraca, Diogo Gomes, Rui L. Aguiar, Design and Evaluation of a Low-Latency CPC Environment for Virtual IEDs	p. 272
Christophe Maudoux, Selma Boumerdassi, LemonLDAP::NG A Full AAA Free Open Source WebSSO Solution	p. 277