

2024 27th Conference on Innovation in Clouds, Internet and Networks (ICIN 2024)

**Paris, France
11 – 14 March 2024**



**IEEE Catalog Number: CFP2450H-POD
ISBN: 979-8-3503-9377-4**

**Copyright © 2024 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:	CFP2450H-POD
ISBN (Print-On-Demand):	979-8-3503-9377-4
ISBN (Online):	979-8-3503-9376-7
ISSN:	2162-3414

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

Table of Content

Table of Content	III
Welcome Message from the Chairs	IX
Organizing Committee	XI
ICIN 2024 – Technical Program Committee	XIX
Additional Reviewers	XXII
ICIN 2024 – Technical Program	XXIII
Conference and co-located Workshops	XXXVI
Paper Index	XXXVII
Author Index	XXXIX
Sponsors	XLVII
<i>Dynamic Schedule Computation for Time-Aware Shaper in Converged IoT-Cloud Environments</i> Papathanail, Georgios; Sakellariou, Ilias; Mamatas, Lefteris; Papadimitriou, Panagiotis	p. 1
<i>Investigation of Container Network Function Deployment Costs in the Edge Cloud</i> Nguyen, Kien; Simonovski, Filip; Loh, Frank; Huu Thanh, Nguyen; Hoßfeld, Tobias	p. 9

In-depth analysis of Kubernetes manifest verification tools for robust CNF deployment

Diarra, Boubacar; Guillouard, Karine; Ouzzif, Meryem; Merle, Philippe; Stefani, Jean-Bernard

p. 17

DAXiot: A Decentralized Authentication and Authorization Scheme for Dynamic IoT Networks

Philipp, Artur; Küpper, Axel; Raschke, Philip

p. 25

Secure and Trustful Cross-domain Communication with Decentralized Identifiers in 5G and Beyond

Dinh-Tuan, Hai; Rodriguez Garzon, Sandro; Fu, Jianeng

p. 32

On cross-layer optimization for real-time remote communication in 5G and beyond

Dimitrovski, Toni; Alexiou, Evangelos; D'Acunto, Lucia; Bergman, Tim; Hindriks, Rick; Turkovic, Belma

p. 37

Round Trip Times (RTTs): Comparing Terrestrial and LEO Satellite Networks

Conde, Javier; Martínez, Gonzalo; Reviriego, Pedro; Hernandez, Jose Alberto

p. 42

Shortcuts: A Simple Mechanism for Reducing the Data Path Delay in Beyond 5G and 6G Networks

Corici, Marius; Zope, Hemant; Buhr, Hauke; Scheich, Christian; Magedanz, Thomas

p. 47

XDQ: Enhancing XDP with Queuing and Packet Scheduling

Alfredsson, Freysteinn; Hurtig, Per; Brunstrom, Anna; Høiland-Jørgensen, Toke; Brouer, Jesper Dangaard

p. 52

FORK: A Kubernetes-compatible Federated Orchestrator of Fog-native applications over multi-domain edge-to-cloud ecosystems

Ejaz, Shahmir; AL-Naday, Mays F.

p. 57

Cost Minimization in Multi-cloud Systems with Runtime Microservice Re-orchestration

Zambianco, Marco; Cretti, Silvio; Siracusa, Domenico

p. 65

VOICE: Value-of-Information for Compute Continuum Ecosystems

Zaccarini, Mattia; Cantelli, Benedetta; Fazio, Maria; Fornaciari, William; Poltronieri, Filippo; Stefanelli, Cesare; Tortonesi, Mauro

p. 73

LLRS: A Low latency Resource Scheduling in Cloud Continuum orchestration
Kule Mukahi, David; Outtagarts, Abdelkader

p. 81

Multi-Objective Microservice Orchestration: Balancing Security and Performance in CCAM
Berlato, Stefano; Cretti, Silvio; Siracusa, Domenico; Ranise, Silvio

p. 88

From a business intent to a network deployment with user-friendly interfaces and natural language processing

Orlandi, Barbara; Lataste, Sandrine; Kerboeuf, Sylvaine; Faucheux, Frederic; Mongazon, Bruno; Marcé, Olivier; Bouillon, Marc; Huang, Xiaofeng; Cherrared, Sihem; Delvallet, Pascal

p. 91

A Platform for Time-Sensitive Networking in Converged IoT-Cloud Environments
Papathanail, Georgios; Sakellariou, Ilias; Mamatas, Lefteris; Papadimitriou, Panagiotis

p. 94

Experiments with Digital Security Processes over SDN-based Cloud-native 5G Core Networks

Kalafatidis, Sarantis; Agrafiotis, Georgios; Giapantzis, Konstantinos; Lalas, Antonios; Votis, Konstantinos

p. 97

ClusterSlice: A Zero-touch Deployment Platform for the Edge Cloud Continuum
Mamatas, Lefteris; Skaperas, Sotiris; Sakellariou, Ilias

p. 100

Demonstrating Runtime Microservice Rescheduling in Hybrid Clouds for Cost Minimization

Cretti, Silvio; Zambianco, Marco; Siracusa, Domenico

p. 103

Revealing the Threat Landscape of Intent-based Management in O-RAN

Rebecchi, Filippo; Cho, Daniel; Abdelrazek, Loay; Forssell, Henrik; Olsson, Jonathan

p. 106

SEAL: Secure and Efficient Authentication using Linkage for Blockchain Network

Hong, Hsiang-Jen; Chang, Sang-Yoon; Fan, Wenjun; Wuthier, Simeon; Zhou, Xiaobo

p. 114

Secure and authorized data sharing among different IoT network domains using Beez Blockchain

Zanardo, Enrico; Martini, Barbara

p. 122

Moving Target Defense for Cloud-Native Applications

Awarkeh, Ali; El Malki, Rim; Rebecchi, Filippo

p. 130

Assessing supervised machine learning in detecting GPS spoofing attacks on UAV application use-cases

Gkogkos, Dimitrios-Evangelos; Mamatas, Lefteris; Petridou, Sophia

p. 138

Edge AI framework for Large Scale Smart Agriculture

Kum, Seung Woo; Oh, Seungtaek; Moon, Jaewon

p. 143

Memory Bandwidth Throttling to Maximise Performance and Reduce Power Consumption

Veitch, Paul; MacNamara, Chris; Browne, John J.

p. 148

Optimizing TSN Routing, Scheduling, and Task Placement in Virtualized Edge-Compute Platforms

Chahed, Hamza; Kassler, Andreas J.

p. 153

Network Planning for the Future Railway Communications

Bermudez Serna, Cristian; Lin Huang, Peng; Prado, Anna; Mas-Machuca, Carmen

p. 158

Intent-based network management with user-friendly interfaces and natural language processing

Orlandi, Barbara; Lataste, Sandrine; Kerboeuf, Sylvaine; Bouillon, Marc; Huang, Xiaofeng; Faucheux, Frederic; Shahbazi, Arzhang; Delvallet, Pascal

p. 163

Segment Routing for Chaining Micro-Services at Different Programmable Network Levels

Mathieu, Bertrand; Dugeon, Olivier D; Ky, Joël Roman; Graff, Philippe; Cholez, Thibault

p. 171

E-Commerce Bot Traffic: In-Network Impact, Detection, and Mitigation

Hemmatpour, Masoud; Zheng, Changgang; Zilberman, Noa

p. 179

Multi-cloud Containerized Service Scheduling Optimizing Computation and Communication

Zhang, Weifan; Kosta, Sokol; Mogensen, Preben

p. 186

gPerfIsol: GNN-based Rate-Limits Allocation for Performance Isolation in Multi-tenant Cloud

Nougnanke, Benoit; Loyer, Justin; Baffier, Jean-François; Ferlin, Simone; Bruyere, Marc; Labit, Yann p. 194

Empowering ISPs with Cloud Gaming User Experience Modeling: A NVIDIA GeForce NOW Use-Case

Dobreff, Gergely; Frey, Dániel; Bader, Attila; Pašić, Alija p. 202

Knowledge Driven Policy Management for Autonomous Networks

Deng, Lingli; He, Keguang; Feng, Chengcheng p. 210

Intent Negotiation Empowers Advanced Operations for the Intent-Driven Autonomous Network

Xie, Pengxiang; Ju, Manchang; Deng, Lingli; He, Keguang; Liu, Kaixi; Zhu, Jinguo p. 216

Towards Intent-Based Scheduling for Performance and Security in Edge-To-Cloud Networks

Santos, José; Truyen, Eddy; Baumann, Christoph; De Turck, Filip; Budigiri, Gerald; Joosen, Wouter p. 222

A Declarative Reasoning Approach to Conflict Management in Intent-Based Networking

Massa, Jacopo; Forti, Stefano; Paganelli, Federica; Dazzi, Patrizio; Brogi, Antonio p. 228

Dual Timescale Orchestration System for Elastic Control of NextG Cloud-Integrated Networks

Pagliuca, Quirino; Chaves, Luciano Jerez; Imputato, Pasquale; Tulino, Antonia; Llorca, Jaime p. 234

Resilient Cloud Control System: Dynamic Frequency Adaptation via Q-Learning

Akbarian, Fatemeh; Tärneberg, William; Fitzgerald, Emma; Kihl, Maria p. 242

A QoE-Guaranteed Routing Scheme for VR Video Streaming Using Monte Carlo Tree Search in SDNs

Xu, Mingchun; Chen, Yu; Zhou, Yingjie N/A

Genetic Algorithm With Gene Regulatory Networks Based Optimization Method for Distributed Video Analysis System

Inoue, Seishiro; Yamauchi, Masaaki; Kominami, Daichi; Shimonishi, Hideyuki;
Murata, Masayuki

p. 257

A Simulation of Energy Optimized Distributed Video Processing on 28 GHz Network

Techasarntikul, Nattaon; Shimonishi, Hideyuki; Murata, Masayuki

p. 265

Multimodal Object Recognition Using Bayesian Attractor Model for 2D and 3D Data

Ando, Haruhito; Kominami, Daichi; Seki, Ryoga; Murata, Masayuki; Shimonishi,
Hideyuki

p. 272