

2016 IEEE/ACM 24th International Symposium on Quality of Service (IWQoS 2016)

**Beijing, China
20-21 June 2016**



**IEEE Catalog Number: CFP16IWQ-POD
ISBN: 978-1-5090-2635-7**

**Copyright © 2016 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 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:	CFP16IWO-POD
ISBN (Print-On-Demand):	978-1-5090-2635-7
ISBN (Online):	978-1-5090-2634-0
ISSN:	1548-615X

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

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

BANDWIDTH-AWARE DELAYED REPAIR IN DISTRIBUTED STORAGE SYSTEMS	1
<i>J. Shen, J. Gu, Y. Zhou, X. Wang</i>	
EFFICIENT ROUTING FOR COOPERATIVE DATA REGENERATION IN HETEROGENEOUS STORAGE NETWORKS	11
<i>Z. Shen, P. Lee, J. Shu</i>	
ZEBRA: DEMAND-AWARE ERASURE CODING FOR DISTRIBUTED STORAGE SYSTEMS	21
<i>J. Li, B. Li</i>	
PRACTICAL FAST SCHEDULING AND ROUTING OVER SLOTTED CSMA FOR WIRELESS MESH NETWORKS	31
<i>T. Yoshihiro, T. Nishimae</i>	
DVMP: INCREMENTAL TRAFFIC-AWARE VM PLACEMENT ON HETEROGENEOUS SERVERS IN DATA CENTERS	41
<i>D. Li, S. Shah, M. Rizvi, F. Wang, W. He</i>	
EFFICIENT AND PROACTIVE V2V INFORMATION DIFFUSION USING NAMED DATA NETWORKING	51
<i>Y. Wang, H. Liu, L. Huang, J. Stankovic</i>	
FDRC – FLOW DURATION TIME BASED RATE CONTROL IN DATA CENTER NETWORKS	61
<i>H. Zhang, X. Shi, X. Yin, Z. Wang, Y. Guo</i>	
FLOWSHADOW: KEEPING UPDATE CONSISTENCY IN SOFTWARE-BASED OPENFLOW SWITCHES	71
<i>Y. Wang, D. Tai, T. Zhang, B. Liu</i>	
AN EXPERIMENTAL INVESTIGATION OF HYPERBOLIC ROUTING WITH A SMART FORWARDING PLANE IN NDN	81
<i>V. Lehman, A. Gawande, R. Aldecoa, D. Krioukov, B. Zhang, L. Zhang, L. Wang</i>	
TETRIS: OPTIMIZING CLOUD RESOURCE USAGE UNBALANCE WITH ELASTIC VM	91
<i>X. Ling, Y. Yuan, D. Wang, J. Yang</i>	
DIVING INTO CLOUD-BASED FILE SYNCHRONIZATION WITH USER COLLABORATION	101
<i>H. Wang, X. Ma, F. Wang, J. Liu, B. Bommana, X. Liu</i>	
A SECURE HIERARCHICAL DEDUPLICATION SYSTEM IN CLOUD STORAGE	110
<i>X. Yao, Y. Lin, Q. Liu, Y. Zhang</i>	
MSRT: MULTI-SOURCE REQUEST AND TRANSMISSION IN CONTENT-CENTRIC NETWORKS	120
<i>Q. Li, B. Gan, G. Hu, Y. Jiang, Q. Liao, M. Xu</i>	
DYNAMIC FLOW SCHEDULING FOR POWER-EFFICIENT DATA CENTER NETWORKS	130
<i>Z. Guo, S. Hui, Y. Xu, H. Chao</i>	
TRAFFIC BIG DATA BASED PATH PLANNING STRATEGY IN PUBLIC VEHICLE SYSTEMS	140
<i>M. Zhu, X.-Y. Liu, M. Qiu, R. Shen, W. Shu, M.-Y. Wu</i>	
A DECISION-TREE-BASED ON-LINE FLOW TABLE COMPRESSING METHOD IN SOFTWARE DEFINED NETWORKS	142
<i>B. Leng, L. Huang, C. Qiao, H. Xu</i>	
ON EFFICIENTLY HARNESSING CLOUD TO SECURELY SOLVE LINEAR REGRESSION AND OTHER MATRIX OPERATIONS	144
<i>Y. Zhu, Z. Wang, C. Qian, J. Wang</i>	
SDNMAC: A SOFTWARE DEFINED NETWORKING BASED MAC PROTOCOL IN VANETS	146
<i>G. Luo, S. Jia, Z. Liu, K. Zhu, L. Zhang</i>	
TUBE CACHING: AN EFFECTIVE CACHING SCHEME IN CONTENT-CENTRIC NETWORKING	148
<i>H. Wu, B. Liu, Y. Li, H. Dai, W. Zhang, Y. Wang</i>	
FTDC: A FAULT-TOLERANT SERVER-CENTRIC DATA CENTER NETWORK	150
<i>Y. Yu, C. Qian</i>	
IP LOOKUP USING MINIMAL PERFECT HASHING	152
<i>Y. Zhang, M. Xu, P. Chen, N. Wang</i>	
ACHIEVING CONVERGENT CAUSAL CONSISTENCY AND HIGH AVAILABILITY WITH ASYNCHRONOUS REPLICATION	154
<i>Y. Tang, H. Sun, X. Wang, X. Liu, Z. Xia</i>	

TRADEOFF BETWEEN EXECUTING TIME AND REVENUE FOR RUNTIME SERVICE COMPOSITION	156
<i>J. Zhang, S. Wang, Q. Sun, F. Yang</i>	
FDALB: FLOW DISTRIBUTION AWARE LOAD BALANCING FOR DATACENTER NETWORKS	158
<i>S. Wang, J. Zhang, T. Huang, T. Pan, J. Liu, Y. Liu</i>	
RELIABILITY IN FUTURE RADIO ACCESS NETWORKS: FROM LINGUISTIC TO QUANTITATIVE DEFINITIONS	160
<i>V. Suryaprakash, I. Malanchini</i>	
HYBRIDFLOW: A LIGHTWEIGHT CONTROL PLANE FOR HYBRID SDN IN ENTERPRISE NETWORKS	162
<i>S. Huang, J. Zhao, X. Wang</i>	
REAL-TIME DETECTION OF PERFORMANCE ANOMALIES FOR CLOUD SERVICES	164
<i>O. Ibadunmoye, T. Metsch, E. Elmroth</i>	
IMPROVING REVENUE FOR RELIABILITY-AWARE VDC EMBEDDING IN A SOFTWARE-DEFINED DATA CENTER	166
<i>X. Wen, Y. Han, B. Yu, X. Chen, Z. Xu</i>	
LOW DELAY STREAMING OF DASH CONTENT WITH WEBRTC DATA CHANNEL	168
<i>S. Zhao, Z. Li, D. Medhi</i>	
MULTI-CHANNEL MODE FOR EMERGENCY SYSTEM IN URBAN CONNECTED VEHICLES	170
<i>S. Khan, M. Franzle</i>	
TUNNELING ON DEMAND: A LIGHTWEIGHT APPROACH FOR IP FAST REROUTING AGAINST MULTI-LINK FAILURES	172
<i>Y. Yang, M. Xu, Q. Li</i>	
MULTICAST ROUTING WITH UNCERTAIN SOURCES IN SOFTWARE-DEFINED NETWORK	178
<i>Z. Hu, D. Guo, J. Xie, B. Ren</i>	
A RELIABILITY ESTIMATION METHOD FOR RECONFIGURABLE ROUTING AND SWITCHING SOFTWARE	184
<i>D. Ma, S. Zhang, A. Wang, L. Ma</i>	
HIGH-THROUGHPUT ANYCAST ROUTING AND CONGESTION-FREE RECONFIGURATION FOR SDNS	190
<i>H. Xu, X. Li, L. Huang, J. Wang, B. Leng</i>	
ADAPTIVE RATE CONTROL OVER MOBILE DATA NETWORKS WITH HEURISTIC RATE COMPENSATIONS	196
<i>K. Liu, Z. Wang, J. Lee, M. Chen, L. Zhang</i>	
FICUS: FAST INCREMENTAL CONSISTENT UPDATE IN SDN BASED ON RELATION GRAPH	202
<i>Q. Li, L. Wang, Y. Jiang, G. Hu, M. Xu, Q. Liao</i>	
HETSDN: EXPLOITING SDN FOR INTELLIGENT NETWORK USAGE IN HETEROGENEOUS WIRELESS NETWORKS	208
<i>K. Chen, R. Izard, H. Hu, K.-C. Wang, J. Martin, J. Deng</i>	
MULTI-RESOURCE PARTIAL-ORDERED TASK SCHEDULING IN CLOUD COMPUTING	214
<i>C. Zhang, Y. Cui, R. Zheng, J. E, J. Wu</i>	
LEXICOGRAPHICAL ORDER MAX-MIN FAIR SOURCE QUOTA ALLOCATION IN MOBILE DELAY-TOLERANT NETWORKS	220
<i>D. Xie, X. Wang, L. Ma</i>	
TOWARD ONLINE VIRTUAL NETWORK FUNCTION PLACEMENT IN SOFTWARE DEFINED NETWORKS	226
<i>B. Zhang, J. Hwang, T. Wood</i>	
SELF-DESCRIBED BUFFER: A NOVEL MECHANISM TO IMPROVE PACKET I/O EFFICIENCY IN LINUX	232
<i>J. Yan, L. Tang, Z. Sun, T. Li, D. Xu</i>	
NETWORK CODES-BASED MULTI-SOURCE TRANSMISSION CONTROL PROTOCOL FOR CONTENT-CENTRIC NETWORKS	238
<i>D. Xie, X. Wang, Q. Wang</i>	
DYNAMIC RESOURCE SCHEDULING IN CLOUD RADIO ACCESS NETWORK WITH MOBILE CLOUD COMPUTING	244
<i>X. Wang, K. Wang, S. Wu, S. Di, K. Yang, H. Jin</i>	
DEMYSTIFYING THE ENERGY EFFICIENCY OF NETWORK FUNCTION VIRTUALIZATION	250
<i>Z. Xu, F. Liu, T. Wang, H. Xu</i>	
M³: PRACTICAL AND RELIABLE MULTI-LAYER VIDEO MULTICAST OVER MULTI-RATE WI-FI NETWORK	260
<i>M. Li, D. Pei, X. Zhang, B. Zhang, Z. Wang, H. Xu, Z. Wang</i>	

ON MOBILE INSTANT VIDEO CLIP SHARING WITH SCREEN SCROLLING	270
<i>L. Zhang, F. Wang, J. Liu, X. Ma</i>	
COVERAGE AND DISTINGUISHABILITY REQUIREMENTS FOR TRAFFIC FLOW MONITORING SYSTEMS	280
<i>H. Zheng, W. Chang, J. Wu</i>	
MCTCP: CONGESTION-AWARE AND ROBUST MULTICAST TCP IN SOFTWARE-DEFINED NETWORKS	290
<i>T. Zhu, F. Wang, Y. Hua, D. Feng, Y. Wan, Q. Shi, Y. Xie</i>	
LCC-GRAPH: A HIGH-PERFORMANCE GRAPH-PROCESSING FRAMEWORK WITH LOW COMMUNICATION COSTS	300
<i>Y. Cheng, F. Wang, H. Jiang, Y. Hua, D. Feng, X. Wang</i>	
USING RECURRENT NEURAL NETWORKS TOWARD BLACK-BOX SYSTEM ANOMALY PREDICTION	310
<i>S. Huang, C. Fung, K. Wang, P. Pei, Z. Luan, D. Qian</i>	
EXPLOITING TIME-VARYING GRAPHS FOR DATA FORWARDING IN MOBILE SOCIAL DELAY-TOLERANT NETWORKS	320
<i>D. Xie, X. Wang, L. Liu, L. Ma</i>	
TOWARDS QOE ASSESSMENT OF ENCRYPTED YOUTUBE ADAPTIVE VIDEO STREAMING IN MOBILE NETWORKS	330
<i>W. Pan, G. Cheng, H. Wu, Y. Tang</i>	
ONLINE INFLUENCE MAXIMIZATION IN NON-STATIONARY SOCIAL NETWORKS	336
<i>Y. Bao, X. Wang, Z. Wang, C. Wu, F. Lau</i>	
SMARTPHONE-ASSISTED SMOOTH LIVE VIDEO BROADCAST ON WEARABLE CAMERAS	342
<i>J. Li, Z. Peng, B. Xiao</i>	
DATA RATE GUARANTEE FOR COFLOW SCHEDULING IN NETWORK FUNCTION VIRTUALIZATION	348
<i>J. Zhang, K. Li, D. Guo, H. Qi, X. Tao, Y. Jin</i>	
CHOQUET INTEGRAL BASED QOS-TO-QOE MAPPING FOR MOBILE VOD APPLICATIONS	354
<i>Y. Liu, J. Liu, Z. Xu, S. Ci</i>	
MODEL-BASED TECHNIQUES FOR QOS ASSESSMENT OF CLOUD-HOSTED CDN SERVICES	360
<i>K. Ravindran, K. Fayzullaev, Y. Wardei</i>	
COLLUSION-RESISTING SECURE NEAREST NEIGHBOR QUERY OVER ENCRYPTED DATA IN CLOUD, REVISITED	366
<i>Y. Zhu, Z. Wang, J. Wang</i>	
YOUR TRAJECTORY PRIVACY CAN BE BREACHED EVEN IF YOU WALK IN GROUPS	372
<i>K. Sui, Y. Zhao, D. Liu, M. Ma, L. Xu, L. Zimu, D. Pei</i>	
DIFFERENTIALLY PRIVATE DENSITY ESTIMATION VIA GAUSSIAN MIXTURES MODEL	378
<i>Y. Wu, Y. Wu, H. Peng, J. Zeng, H. Chen, C. Li</i>	
TRAFFICAV: AN EFFECTIVE AND EXPLAINABLE DETECTION OF MOBILE MALWARE BEHAVIOR USING NETWORK TRAFFIC	384
<i>S. Wang, Z. Chen, L. Zhang, Q. Yan, B. Yang, L. Peng, Z. Jia</i>	
SELECTING MOST INFORMATIVE CONTRIBUTORS WITH UNKNOWN COSTS FOR BUDGETED CROWDSENSING	390
<i>S. Yang, F. Wu, S. Tang, T. Luo, X. Gao, L. Kong, G. Chen</i>	
QUICKPOINT: EFFICIENTLY IDENTIFYING DENSEST SUB-GRAPHS IN ONLINE SOCIAL NETWORKS FOR EVENT STREAM DISSEMINATION	396
<i>C. Lin, H. Chen, H. Jin, J. Liu</i>	
ON THE PERFORMANCE OF CLOUD STORAGE APPLICATIONS WITH GLOBAL MEASUREMENT	402
<i>G. Wu, F. Liu, H. Tang, K. Huang, Q. Zhang, Z. Li, B. Zhao, H. Jin</i>	
ENHANCING PARTICIPANT SELECTION THROUGH CACHING IN MOBILE CROWD SENSING	412
<i>H. Li, T. Li, F. Li, W. Wang, Y. Wang</i>	
CERTIFICATE-AWARE ENCRYPTED TRAFFIC CLASSIFICATION USING SECOND-ORDER MARKOV CHAIN	422
<i>M. Shen, M. Wei, L. Zhu, M. Wang, F. Li</i>	
TRUTHFUL INCENTIVE MECHANISM FOR VEHICLE-BASED NONDETERMINISTIC CROWDSENSING	432
<i>C. Hu, M. Xiao, L. Huang, G. Gao</i>	
THE DETECTION OF PHYSICAL ATTACKS AGAINST IBEACON TRANSMITTERS	442
<i>C. Liu, P. Zhao, K. Bian, T. Zhao, Y. Wei</i>	