# Contents – Part IV

## Software Systems and Programming Models

FT-Offload: A Scalable Fault-Tolerance Programing Model on MIC Cluster  
*Cheng Chen, Yunfei Du, Zhen Xu, and Canqun Yang*  
3

MC-RAIS: Multi-chunk Redundant Array of Independent SSDs  
with Improved Performance  
*Suzhen Wu, Weijian Yang, Bo Mao, and Yanping Lin*  
18

An Energy Efficient Storage System for Astronomical Observation Data  
on Dome A  
*Zichao Yuan, Ce Yu, Jizhou Sun, Jian Xiao, Jianmei Wang,  
Zhaohui Shang, and Yi Hu*  
33

Parallel Aware Hybrid Solid-State Storage  
*Dan He, Fang Wang, Dan Feng, Jingning Liu, Yunxiang Wu, Ying He,  
and Yang Hu*  
47

Automatic Optimization of Software Transactional Memory  
Through Linear Regression and Decision Tree  
*Yang Xiao, Zhen Li, Ehsan Atoofian, and Ali Jannesari*  
61

A Data-Centric Tool to Improve the Performance of Multithreaded Program  
on NUMA  
*Dan Zeng, Liang Zhu, Xiaofei Liao, and Hai Jin*  
74

A Light-Weight Hot Data Identification Scheme via Grouping-based  
LRU Lists  
*Biaobiao Shen, Yongkun Li, Yinlong Xu, and Yubiao Pan*  
88

iPLAR: Towards Interactive Programming with Parallel Linear Algebra  
in R  
*Zhaokang Wang, Shiqing Fan, Rong Gu, Chunfeng Yuan,  
and Yihua Huang*  
104

Enhancing I/O Scheduler Performance by Exploiting Internal Parallelism  
of SSDs  
*Jiayang Guo, Yimin Hu, and Bo Mao*  
118

A Performance and Scalability Analysis of the MPI Based Tools Utilized  
in a Large Ice Sheet Model Executing in a Multicore Environment  
*Phillip Dickens*  
131
Performance Modeling and Evaluation

An Efficient Algorithm for a Generalized LCS Problem

Daxin Zhu, Yingjie Wu, and Xiaodong Wang

151

On Exploring a Quantum Particle Swarm Optimization Method for Urban Traffic Light Scheduling

Wenbin Hu, Huan Wang, Liping Yan, and Bo Du

161

Identifying Repeated Interleavings to Improve the Efficiency of Concurrency Bug Detection

Zhendong Wu, Kai Lu, and Xiaoping Wang

175

Global Reliability Evaluation for Cloud Storage Systems with Proactive Fault Tolerance

Jing Li, Mingze Li, Gang Wang, Xiaoguang Liu, Zhongwei Li, and Huijun Tang

189

Performance Evaluation and Optimization of Wi-Fi Display on Android

Xianfeng Li and Baobao Jin

204

A Novel Scheduling Algorithm for File Fetch in Transparent Computing

Kehua Guo, Yayuan Tang, and Jiacheng Gu

216

Performance Evaluation of HPGMG on Tianhe-2: Early Experience

Yulong Ao, Yiqun Liu, Chao Yang, Fangfang Liu, Peng Zhang, Yutong Lu, and Yunfei Du

230

Joint Power and Reduced Spectral Leakage-Based Resource Allocation for D2D Communications in 5G

Mithun Mukherjee, Lei Shu, Yan Zhang, Zhangbing Zhou, and Kun Wang

244

Performance Analysis for Job Scheduling in Hierarchical HPC Systems: A Coloured Petri Nets Method

Zhijia Li, Li Jiao, and Xiang Hu

259

An Optimization Strategy of Energy Consumption for Data Transmission Based on Optimal Stopping Theory in Mobile Networks

Ying Peng, Nao Wang, and Gaocai Wang

281

Exploration of the Relationship Between Just-in-Time Compilation Policy and Number of Cores

Mingkai Huang, Xianhua Liu, Tingyu Zhang, and Xu Cheng

293

CSAP: A Performance Predictor for Climate Simulation Applications on Intel CPUs

Ruizhe Li, Li Liu, Cheng Zhang, and Guangwen Yang

308
On Routing Algorithms for the DPillar Data Centre Networks .......................... 329
   Abbas Eslami Kiasari, Javier Navaridas, and Iain A. Stewart

MR-COF: A Genetic MapReduce Configuration Optimization Framework ... 344
   Chao Liu, Deze Zeng, Hong Yao, Chengyu Hu, Xuesong Yan, and Yuanyuan Fan

Analysis of Repair Cost in Distributed Storage Systems with Fault-Tolerant Coding Strategies .......................................................... 358
   Yanbo Lu, Jie Hao, Xin-Ji Liu, and Shu-Tao Xia

Design Efficient In-Database Video Storage Approach by Learning from Performance Evaluation of BLOB ............................................... 372
   Hui Li, Mei Chen, Zhenyu Dai, Ming Zhu, and Menglin Huang

Skyline Query on Anti-correlated Distributions: From the Perspective of Spatial Index ................................................................. 386
   Jinchao Zhang, Dong Zhang, Bo Yu, Bo Li, Weiping Wang, and Dan Meng

PNSICC: A Novel Parallel Network Security Inspection Mechanism Based on Cloud Computing ......................................................... 402
   Jin He, Mianxiong Dong, Kaoru Ota, Minyu Fan, and Guangwei Wang

Simulation Platform for X-Ray Computed Tomography Based on Low-Power Systems ................................................................. 416
   Estefania Serrano, Javier Garcia Blas, Alberto Verza, and Jesus Carretero

STRUCTURE: A Strategyproof Double Auction for Heterogeneous Secondary Spectrum Markets ......................................................... 427
   Yu-E Sun, He Huang, Miaomiao Tian, Zehao Sun, Wei Yang, Hansong Guo, and Liusheng Huang

Reality Mining with Mobile Data: Understanding the Impact of Network Structure on Propagation Dynamics ........................................ 442
   Yuanfang Chen, Noel Crespi, Lei Shu, and Gyu Myoung Lee

Reducing Journaling Overhead with Hybrid Buffer Cache ......................... 462
   Zhiyong Zhang, Lei Ju, and Zhiping Jia

A Green Scheduler for Cloud Data Centers Using Renewable Energy ......... 476
   Chonglin Gu, Chunyan Liu, Chen Shi, Zhixiang He, Heijiao Huang, and Xiaohua Jia

Fine-Grained Fault-Tolerant Adaptive Routing for Networks-on-Chip ............ 492
   Junxiu Liu, Jim Harkin, Liam Maguire, Yuhua Li, Lei Wan, and Yuling Luo
On the Optimal Provider Selection for Repair in Distributed Storage System
with Network Coding ............................................................. 506
    Chengjin Jia, Jin Wang, Yanqin Zhu, Xin Wang, Kejie Lu, Xiumin Wang,
    and Zhengqing Wen

Local State Reusing for Efficient Model Checking of Multithreaded
Programs .............................................................................. 521
    Junrui Zhou, Hong An, Yunyun Wang, and Junshi Chen

Intelligent Road Congestion Prediction Employing Queueing Based Model. . . 539
    Lianghao Gao, Chengfang Ma, Lei Liu, and Xining Wei

Evaluation and Analysis of Three Typical Resource Allocation Algorithms
in Virtual Router Platform ....................................................... 549
    Xianming Gao, Baosheng Wang, Xiaozhe Zhang, and Shicong Ma

Beyond Data Parallelism: Identifying Parallel Tasks in Sequential Programs . . 569
    Zhen Li, Bo Zhao, Ali Jannesari, and Felix Wolf

Fast Data-Dependence Profiling by Skipping Repeatedly Executed
Memory Operations ................................................................. 583
    Zhen Li, Michael Beaumont, Ali Jannesari, and Felix Wolf

P-index: An Efficient Searchable Metadata Indexing Scheme Based
on Data Provenance in Cold Storage .......................................... 597
    Jinjun Liu, Dan Feng, Yu Hua, Bin Peng, Pengfei Zuo,
    and Yuanyuan Sun

Performance Optimization and Evaluation of Space Management in Cloud
Storage Systems .................................................................... 612
    Guangping Xu, Huan Li, Qunfang Mao, Sheng Lin, and Hua Zhang

Performance Prediction for Concurrent Workloads in Distributed
Database Systems ................................................................... 626
    Hui Li, Xiaohuan Hou, Mei Chen, Zhenyu Dai, Ming Zhu,
    and Menglin Huang

An Energy-Aware File Relocation Strategy Based on File-Access
Frequency and Correlations ..................................................... 640
    Cheng Hu and Yuhui Deng

Projective Synchronization for Complex Dynamical Networks
of Non-delayed and Delayed Coupling with Different Scale Factors
via Impulsive Control ........................................................... 654
    Yuxiu Li and Guoliang Cai

Elastic Database Replication in the Cloud .................................... 667
    Xianxia Zou, Jiuhui Pan, Wei Du, and Shuhong Chen
A Predetermined Deployment Technique for Lifetime Optimization in Clustered WSNs

Subir Halder and Amrita Ghosal

Traffic Replay in Virtual Network Based on IP-Mapping

Lun Li, Zhiyu Hao, Yongzheng Zhang, Zhenquan Ding, and Haiqiang Fei

Optimizing the Overheads for Uncoordinated Proactive Checkpointing

Lei Zhu, Jianhua Gu, and Zhennao Cai

Tunneling-based Multi-path Routing Mechanism in Packet-Switched Non-Geostationary Satellite Networks

Guyu Hu, Zhaofeng Wu, Fenglin Jin, Bowei Yang, Yu Song, and Yinjin Fu

Cost-Effective Scheduling Analysis Through Discrete Event Simulation for Distributed Systems

Siti Fajar Jalal, Masnida Hussin, Abdullah Muhammed, and Rohaya Latip

Energy Consumption Prediction Based on Time-Series Models for CPU-Intensive Activities in the Cloud

Juan Li, Xiao Liu, Zhou Zhao, and Jin Liu

HYPAD: Hyper-Graph-Driven Approach for Parallel Data Warehouse Design

Ahcene Boukorca, Ladjel Bellatreche, and Soumia Benkrid

Efficient Space Management and Wear Leveling for PCM-Based Storage Systems

Zhangling Wu, Peiquan Jin, and Lihua Yue

An Investigation of the Impact of Double Bit-Flip Error Variants on Program Execution

Fatimah Adamu-Fika and Arshad Jhumka

An Efficient Dynamic Programming Algorithm for SEQ-IC-SEQ-EC-LCS Problem

Daxin Zhu, Lei Wang, Yingjie Wu, and Xiaodong Wang

A Hybrid QoS Evaluation Tool Based on the Cloud Computing Platform

Yanjun Shu, Yan Zhao, Hongwei Liu, Decheng Zuo, and Xiaoizong Yang

Author Index
Algorithms and Architectures for Parallel Processing
15th International Conference, ICA3PP 2015,
Zhangjiajie, China, November 18-20, 2015,
Proceedings, Part IV
Wang, G.; Zomaya, A.Y.; Martinez Perez, G.; Li, K. (Eds.)
2015, L, 845 p. 353 illus. in color., Softcover
ISBN: 978-3-319-27139-2