

Publications

Book chapter

Intelligent data migration policies in a write-optimized copy-on-write tiered storage stack

Wünsche, Johannes; Karim, Sajad; Kuhn, Michael; Broneske, David; Saake, Gunter

In: Proceedings of the 3rd Workshop on Challenges and Opportunities of Efficient and Performant Storage Systems - New York, NY, United States : Association for Computing Machinery . - 2023, S. 17-26

›Publication link (<https://doi.org/10.1145/3578353.358954>)

Book chapter

Vecpar - a framework for portability and parallelization

Mania, Georgiana; Styles, Nicholas; Kuhn, Michael; Salzburger, Andreas; Yeo, Beomki; Ludwig, Thomas

In: Computational Science – ICCS 2023 , 1st ed. 2023. - Cham : Springer Nature Switzerland ; Mikyška, Jiří., S. 253-267 - (Lecture notes in computer science book series; volume 14073)

›Publication link (https://doi.org/10.1007/978-3-031-35995-8_1)

Book chapter

Data-aware compression for HPC using machine learning

Plehn, Julius; Fuchs, Anna; Kuhn, Michael; Lüttgau, Jakob; Ludwig, Thomas

In: Proceedings of the Workshop on Challenges and Opportunities of Efficient and Performant Storage Systems / Kuhn, Michael - New York, NY, United States : Association for Computing Machinery ; Kuhn, Michael . - 2022, S. 8-15

›Publication link (<https://doi.org/10.1145/3503646.352429>)

Book chapter

Energy efficiency of parallel file systems on an ARM cluster

Erleben, Timm Leon; Duwe, Kira; Saak, Jens; Köhler, Martin; Kuhn, Michael

In: ENERGY 2022 - [Wilmington, DE] : IARIA ; Sultan, Vivian, S. 42-48

›Publication link (https://www.thinkmind.org/index.php?view=article&articleid=energy_2022_1_90_3004)

Peer-reviewed journal article

Green storage - parallel file systems on ARM

Erleben, Timm Leon; Duwe, Kira; Saak, Jens; Köhler, Martin; Kuhn, Michael

In: International Journal on Advances in Software - [S.l.]: IARIA, Bd. 15 (2022), 3&4, S. 200-210

›Publication link (<https://www.iariajournals.org/software/tocv15n34.htm>)

Peer-reviewed journal article

Automated performance analysis tools framework for HPC programs

Keiff, Maximillian; Voigt, Frederic; Fuchs, Anna; Kuhn, Michael; Squar, Jannek; Ludwig, Thomas

In: Procedia computer science - Amsterdam [u.a.] : Elsevier, Bd. 207 (2022), S. 1067-1076

›Publication link (<https://doi.org/10.1016/j.procs.2022.09.168>)

Peer-reviewed journal article

Content queries and in-depth analysis on version-controlled software

Squar, Jannek; Schroeter, Niclas; Fuchs, Anna; Kuhn, Michael; Ludwig, Thomas

In: Procedia computer science - Amsterdam [u.a.] : Elsevier, Bd. 207 (2022), S. 1261-1270

›Publication link (<https://doi.org/10.1016/j.procs.2022.09.168>)

Peer-reviewed journal article

Data-aware compression for HPC using machine learning

Plehn, Julius; Fuchs, Anna; Kuhn, Michael; Lüttgau, Jakob; Ludwig, Thomas

In: ACM SIGOPS operating systems review/ Association for Computing Machinery - New York, NY: ACM, Bd. 56 (2022), 1, S. 62-69

›Publication link (<http://dx.doi.org/10.1145/3544497.3544500>)

Editor

Proceedings of the Workshop on Challenges and Opportunities of Efficient and Performant Storage Systems

Kuhn, Michael; Duwe, Kira; Acquaviva, Jean-Thomas; Chasapis, Konstantinos; Boukhobza, Jalil

In: New York, NY, United States: Association for Computing Machinery, 2022, 1 online resource (44 pages) (ACM Conferences; ACM Digital Library), ISBN: 978-1-4503-9209-9

›Publication link (<http://dx.doi.org/10.1145/350364>)

Book chapter

Dissecting self-describing data formats to enable advanced querying of file metadata

Duwe, Kira; Kuhn, Michael

In: Konferenz: 14th ACM International Conference on Systems and Storage, SYSTOR 2021, Haifa, Israel, 14.-16. June 2021, SYSTOR 2021 - New York: Association for Computing Machinery . - 2021, Artikel 12, insges. 7 S.

›Publication link (<http://dx.doi.org/10.1145/3456727.346377>)

Book chapter

Using ceph's BlueStore as object storage in HPC storage framework

Duwe, Kira; Kuhn, Michael

In: Proceedings of the Workshop on Challenges and Opportunities of Efficient and Performant Storage Systems (CHEOPS) - in conjunction with EuroSys 2021 - New York: ACM; Kuhn, Michael . - 2021, Artikel 3, insges. 6 S.

›Publication link (<http://dx.doi.org/10.1145/3439839.345873>)

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heimdallr - improving compile time correctness checking for message passing with rust

Blesel, Michael; Kuhn, Michael; Squar, Jannek

In: High Performance Computing - Cham: Springer International Publishing; Jagode, Heike . - 2021, S. 19 211 - (Theoretical Computer Science and General Issues; 12761)

›Publication link (http://dx.doi.org/10.1007/978-3-030-90539-2_1)

Book chapter

Coupling storage systems and self-describing data formats for global metadata management

Kuhn, Michael; Duwe, Kira

In: 2020 International Conference on Computational Science and Computational Intelligence/ CSCI - Piscataway, NJ: IEEE . - 2021

›Publication link (<http://dx.doi.org/10.1109/CSCI51800.2020.0022>)

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A GPU-based Kalman filter for track fitting

Ai, Xiaocong; Mania, Georgiana; Gray, Heather M.; Kuhn, Michael; Styles, Nicholas

In: Computing and software for big science - Cham, Switzerland: Springer International Publishing, Bd. 5 (2021), insges. 16 S.

›Publication link (<http://dx.doi.org/10.1007/s41781-021-00065>)

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Proceedings of the Workshop on Challenges and Opportunities of Efficient and Performant Storage Systems (CHEOPS) - in conjunction with EuroSys 2021

Kuhn, Michael; Duwe, Kira; Acquaviva, Jean-Thomas; Chasapis, Konstantinos; Boukhobza, Jalil

In: New York: ACM, 2021, 1 Online-Ressource, ISBN: 978-1-4503-8302-8 Kongress: CHEOPS '21 virtual 2021.04.

›Publication link (<https://dl.acm.org/doi/proceedings/10.1145/3439839#issue-download>)

Editor

Euro-Par 2020: Parallel Processing Workshops - Euro-Par 2020 International Workshops, Warsaw, Poland, August 24-25, 2020, Revised Selected Papers

Balis, Bartosz; B. Heras, Dora; Antonelli, Laura; Bracciali, Andrea; Gruber, Thomas; Hyun-Wook, Jin; Kuhn, Michael; Scott, Stephen L.; Unat, Didem; Wyrzykowski, Roman

In: Cham: Imprint: Springer, 2021., 1st ed. 2021., 1 Online-Ressource(XV, 358 p. 110 illus., 99 illus. in color.) - (Springer eBook Collection; Theoretical Computer Science and General Issues; 12480)

›Publication link (<http://dx.doi.org/10.1007/978-3-030-71593->

Book chapter

ArduPower v2: Open and modular power measurement for HPC components

Bremer, Daniel; Kuhn, Michael; Heidari, Mohammad Reza

In: The Tenth International Conference on Smart Grids, Green Communications and IT Energy-aware Technologies, ENERGY 2020 - IARIA, 2020 . - 2020, S. 24-29[Konferenz: Tenth International Conference on Smart Grids, Green Communications and IT Energy-aware Technologies, ENERGY 2020, Lisbon, Portugal, September 27, 2020 to October 01, 2020]

Book chapter

Compiler Assisted Source Transformation of OpenMP Kernels

Squar, Jannek; Jammer, Tim; Blesel, Michael; Kuhn, Michael; Ludwig, Thomas

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›Publication link (<https://dx.doi.org/10.1109/ispd51135.2020.0001>

Book chapter

Improving energy efficiency of scientific data compression with decision trees

Kuhn, Michael; Plehn, Julius; Alforov, Yevhen; Ludwig, Thomas

In: The Tenth International Conference on Smart Grids, Green Communications and IT Energy-aware Technologies, ENERGY 2020 - IARIA, 2020 . - 2020, S. 17-23[Konferenz: Tenth International Conference on Smart Grids, Green Communications and IT Energy-aware Technologies, ENERGY 2020, Lisbon, Portugal, September 27, 2020 to October 01, 2020]

Peer-reviewed journal article

Mission possible: Unify HPC and Big Data stacks towards application-defined blobs at the storage layer

Matri, Pierre; Alforov, Yevhen; Brandon, Álvaro; Pérez, María S.; Costan, Alexandru; Antoniu, Gabriel; Kuhn, Michael; Carns, Philip; Ludwig, Thomas

In: Future Generation Computer Systems, Elsevier BV, Bd. 109, S. 668-677

›Publication link (<https://dx.doi.org/10.1016/j.future.2018.07.003>

Peer-reviewed journal article

State of the Art and Future Trends in Data Reduction for High-Performance Computing

Duwe, Kira; Lüttgau, Jakob; Mania, Georgiana; Squar, Jannek; Fuchs, Anna; Kuhn, Michael; Betke, Euge; Ludwig, Thomas

In: Supercomputing Frontiers and Innovations, Publishing Center of South Ural State University, S. 4-36, 2020

›Publication link (<https://dx.doi.org/10.14529/jsfi20010>)

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Parallele Dateisysteme

Kuhn, Michael

In: Informatik Spektrum, Springer Science and Business Media LLC, Bd. 42, Heft 5, S. 360-364

›Publication link (<https://dx.doi.org/10.1007/s00287-019-01209->

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Towards an HPC Certification Program

Kunkel, Julian; Himstedt, Kai; Hübbe, Nathanael; Stüben, Hinnerk; Schröder, Sandra; Kuhn, Michael; Riebisch, Matthias; Olbrich, Stephan; Ludwig, Thomas; Filingner, Weronika; Acquaviva, Jean-Thomas; Gerbes, Anja; Lafayette, Lev

In: The Journal of Computational Science Education, The Shodor Education Foundation, Inc., Bd. 10, Heft 1, S. 88-89

›Publication link (<https://dx.doi.org/10.22369/issn.2153-4136/10/1/1>)

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Towards Green Scientific Data Compression Through High-Level I/O Interfaces

Alforov, Yevhen; Ludwig, Thomas; Novikova, Anastasiia; Kuhn, Michael; Kunkel, Julian

In: 2018 30th International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD), IEEE

›Publication link (<https://dx.doi.org/10.1109/cahpc.2018.864592>)

Peer-reviewed journal article

A Survey of Storage Systems for High-Performance Computing

Lüttgau, Jakob; Kuhn, Michael; Duwe, Kira; Alforov, Yevhen; Betke, Eugen; Kunkel, Julian; Ludwig, Thomas

In: Supercomputing Frontiers and Innovations, Publishing Center of South Ural State University, S. 31-58, 2018

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Book chapter

Performance and Power Optimization

Kuhn, Michael; Chasapis, Konstantinos; Kuhn, Manuela; Malka, Janusz; Stibor, Thomas; Nešković, Gvozden

In: Helmholtz Portfolio Theme Large-Scale Data Management and Analysis (LSDMA), KIT Scientific Publishing, S. 141-160, 2017, 978-3-7315-0695-9

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JULEA: A Flexible Storage Framework for HPC

Kuhn, Michael

In: Lecture Notes in Computer Science, Springer International Publishing, S. 712-723, High Performance Computing

›Publication link (https://dx.doi.org/10.1007/978-3-319-67630-2_5)

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Could Blobs Fuel Storage-Based Convergence Between HPC and Big Data?

Matri, Pierre; Alforov, Yevhen; Brandon, Alvaro; Kuhn, Michael; Carns, Philip; Ludwig, Thomas

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Analyzing the energy consumption of the storage data path

Llopis, Pablo; Dolz, Manuel F.; Blas, Javier Garcia; Isaila, Florin; Heidari, Mohammad Reza; Kuhn, Michael

In: The Journal of Supercomputing, Springer Science and Business Media LLC, Bd. 72, Heft 11, S. 4089-4106

›Publication link (<https://dx.doi.org/10.1007/s11227-016-1729-9>)

Peer-reviewed journal article

Data Compression for Climate Data

Kuhn, Michael; Kunkel, Julian; Ludwig, Thomas

In: Supercomputing Frontiers and Innovations, Publishing Center of South Ural State University, S. 75-94, 2016

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Dynamically Adaptable I/O Semantics for High Performance Computing

Kuhn, Michael

In: Lecture Notes in Computer Science, Springer International Publishing, S. 240-256, High Performance Computing

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ARDUPOWER: A low-cost wattmeter to improve energy efficiency of HPC applications

Dolz, Manuel F.; Heidari, Mohammad Reza; Kuhn, Michael; Ludwig, Thomas; Fabregat, German

In: 2015 Sixth International Green and Sustainable Computing Conference (IGSC), IEEE

›Publication link (<https://dx.doi.org/10.1109/igcc.2015.739366>)

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Droste, Alexander; Kuhn, Michael; Ludwig, Thomas

In: Proceedings of the Second Workshop on the LLVM Compiler Infrastructure in HPC - LLVM '15, ACM Press

›Publication link (<https://dx.doi.org/10.1145/2833157.283315>)

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A Best Practice Analysis of HDF5 and NetCDF-4 Using Lustre

Bartz, Christopher; Chasapis, Konstantinos; Kuhn, Michael; Nerge, Petra; Ludwig, Thomas

In: Lecture Notes in Computer Science, Springer International Publishing, 2015, S. 274-281, High Performance Computing

›Publication link (https://dx.doi.org/10.1007/978-3-319-20119-1_2)

Book chapter

Big Data Research at DKRZ – Climate Model Data Production Workflow

Lautenschlager, Michael; Adamidis, Panagiotis; Kuhn, Michael

In: Big Data and High Performance Computing, IOS Press, S. 133-155, 2015, 978-1-61499-582-1

›Publication link (<https://dx.doi.org/10.3233/978-1-61499-583-8-13>)

Article in conference proceedings

Analyzing Power Consumption of I/O Operations in HPC Applications

Llopis, Pablo; Dolz, Manuel F.; García-Blas, Javier; Isaila, Florin; Carretero, Jesús; Heidari, Mohammad Reza; Kuhn, Michael

In: Proceedings of the Second International Workshop on Sustainable Ultrascale Computing Systems (NESUS 2015), Computer Architecture, Communications and Systems Group (ARCOS), S. 107-116, 2015, 978-84-608-2581-4

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Evaluating Lustre's Metadata Server on a Multi-Socket Platform

Chasapis, Konstantinos; Dolz, Manuel F.; Kuhn, Michael; Ludwig, Thomas

In: 2014 9th Parallel Data Storage Workshop, IEEE

›Publication link (<https://dx.doi.org/10.1109/pdsw.2014>)

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Exascale Storage Systems - An Analytical Study of Expenses

Kunkel, Julian; Kuhn, Michael; Ludwig, Thomas

In: Supercomputing Frontiers and Innovations, Publishing Center of South Ural State University, S. 116-134, 2014

›Publication link (<https://dx.doi.org/10.14529/jsfi14010>)

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Kuhn, Michael; Chasapis, Konstantinos; Dolz, Manuel; Ludwig, Thomas

In: Supercomputing, Springer International Publishing, 8488, 2014, 978-3-319-07517-4

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Evaluating Power-Performance Benefits of Data Compression in HPC Storage Servers

Chasapis, Konstantinos; Dolz, Manuel; Kuhn, Michael; Ludwig, Thomas

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Book chapter

A Semantics-Aware I/O Interface for High Performance Computing

Kuhn, Michael

In: Lecture Notes in Computer Science, Springer Berlin Heidelberg, S. 408-421, Supercomputing

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A study on data deduplication in HPC storage systems

Meister, Dirk; Kaiser, Jurgen; Brinkmann, Andre; Cortes, Toni; Kuhn, Michael; Kunkel, Julian

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Simulation-Aided Performance Evaluation of Server-Side Input/Output Optimizations

Kuhn, Michael; Kunkel, Julian M.; Ludwig, Thomas

In: 2012 20th Euromicro International Conference on Parallel, Distributed and Network-based Processing, IEEE

›Publication link (<https://dx.doi.org/10.1109/pdp.2012.3>)

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In: Handbook of Energy-Aware and Green Computing, Chapman and Hall/CRC Press Taylor and Francis Group, S. 709-743, 2012, 978-1-4398-5040-4

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Towards an energy-aware scientific I/O interface - Stretching the ADIOS interface to foster performance analysis and energy awareness

Kunkel, Julian M.; Minartz, Timo; Kuhn, Michael; Ludwig, Thomas

In: Computer Science - Research and Development, Springer Science and Business Media LLC, Bd. 27, Heft 4, S. 337-345

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Scientific Computing: Performance and Efficiency in Climate Models

Schröder, Sandra; Kuhn, Michael; Hübbe, Nathanael; Kunkel, Julian; Minartz, Timo; Nerge, Petra; Wasserfall, Florens; Ludwig, Thomas

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Optimizations for Two-Phase Collective I/O

Kuhn, Michael; Kunkel, Julian; Tsujita, Yuichi; Muguruma, Hidetaka; Ludwig, Thomas

In: Applications, Tools and Techniques on the Road to Exascale Computing, IOS Press, 22, S. 455-462, 2012, 978-1-61499-040-6

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Evaluating the Influence of File System Interfaces and Semantics on I/O Throughput in High Performance Computing

Janssen, Christina; Kuhn, Michael; Ludwig, Thomas

In: Proceedings of the Work in Progress Session, 20th Euromicro International Conference on Parallel,

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Collecting energy consumption of scientific data - Energy demands for files during their life cycle

Kunkel, Julian M.; Mordvinova, Olga; Kuhn, Michael; Ludwig, Thomas

In: Computer Science - Research and Development, Springer Science and Business Media LLC, Bd. 25, Heft 3-4, S. 197-205

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Dynamic file system semantics to enable metadata optimizations in PVFS

Kuhn, Michael; Kunkel, Julian Martin; Ludwig, Thomas

In: Concurrency and Computation: Practice and Experience, Wiley, Bd. 21, Heft 14, S. 1775-1788

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Book chapter

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In: Lecture Notes in Computer Science, Springer Berlin Heidelberg, S. 90-99, Euro-Par 2008 – Parallel Processing

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Analysis of the MPI-IO Optimization Levels with the PIOViz Jumpshot Enhancement

Ludwig, Thomas; Krempel, Stephan; Kuhn, Michael; Kunkel, Julian; Lohse, Christian

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