

CURRICULUM VITAE

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Education

Ph.D. in Computer Science, University of Washington, August 1995

Advisors: Henry M. Levy and Edward D. Lazowska

Dissertation: *An Operating System Structure for Wide-Address Architectures*

Master of Science in Computer Science, University of Washington, May 1989

Advisor: Henry M. Levy

Bachelor of Arts, Dartmouth College, June 1985 (*cum laude*)

Double Major: Mathematics and Computer Science

Professional Appointments

Professor, Department of Computer Science, Duke University (effective July 2006).

Visiting Scholar, Renaissance Computing Institute (RENCI), 2011-2012.

Associate Professor, Department of Computer Science, Duke University (effective July 2002).

Visiting Scholar, Hewlett-Packard Laboratories, September 2003–June 2004.

Assistant Professor, Department of Computer Science, Duke University, September 1995–July 2002.

Senior Software Engineer, Digital Equipment Corporation, 1985–1994 (effective July 1987).

Research Summary and Background

My research deals with experimental software systems for efficient, secure, and reliable sharing of resources and information in computer networks ranging from clusters to the global Internet. Much of my recent research focuses on automated dynamic resource management for on-demand computing and storage utilities. Other research topics include network storage services, I/O prefetching, low-overhead network I/O, active storage, large-scale Internet services, Web caching and content delivery, self-organizing Internet service utilities, network emulation, grid computing environments, and multidisciplinary research efforts directed at managing, storing, and processing massive spatial data. My earlier work at the University of Washington dealt with distributed data sharing and data, cluster computing, and virtual memory models for wide-address (e.g., 64-bit) computers. My academic career is supplemented by several years of Unix kernel engineering experience with Digital Equipment Corporation overlapping with my graduate work.

Honors and Awards

Award papers: *Symposium on Operating System Design and Implementation (OSDI)*, 2000; *Usenix Technical Conference*, 2002.

Paper *Designing for Disasters* selected for Test of Time award from USENIX *File and Storage Technologies (FAST)* symposium (published in 2004, selected in 2018). This paper proposes an optimization approach to balance safety and cost in disaster recovery solutions.

Paper on Dynamic Virtual Clusters selected as one of “best 20 papers over 20 years” in *IEEE High Performance Distributed Computing (HPDC)* symposium (published in 2003, selected in 2012). This paper is one of the earliest papers on cloud infrastructure as a service (IaaS).

Paper on petascale file system analysis nominated for Best Paper and also for Best Student Paper for SC12 (IEEE 2012 *International Conference for High Performance Computing, Networking, Storage, and Analysis*): one of 7/479 submissions nominated for one or both of these categories.

IBM Faculty Partnership award, 2002; IBM Faculty Award: 2003, 2004, 2007-2011, 2014.

NetApp Faculty Fellowship, 2009.

National Science Foundation CAREER Young Investigator Research Initiation Award, 1996.

Intel Foundation Graduate Fellowship, 1993-1994.

Digital Equipment Corporation GEEP Fellowship, 1987-1989

Professional Activities

Advisory boards: *Intel Science and Technology Center for Cloud Computing (ISTC-CC)*, CMU/Berkeley/Princeton, GaTech. 2013-2016. NSF *Southeastern Garden Array (SEGA)* project, Northern Arizona University, 2013-2014. *Applied Research Center for Computer Networks (ARCCN.ru)* advisory board 2014-2015. NSF “Looking Beyond the Internet” Planning Group (2015-2016).

GENI working groups: NSF Global Environment for Network Investigations (GENI) project: *Services Working Group* (chair) 2007-2009; *Control Framework Working Group* (co-chair), 2009-2010. GENI Architecture Board voting member, 2011-2013.

Editorial boards: *Communications of the ACM: CACM Contributed Articles (2018-)*; *CACM Research Highlights (CACM-RH)*, 2014-2017.

Program committees: ACM *Symposium on Cloud Computing (SOCC 2019)*, ACM/IFIP/USENIX *International Middleware Conference* 2018; 12th USENIX *Symposium on Operating Systems Design and Implementation (OSDI '16)*, ACM SIGCOMM 2015, *USENIX/ACM Symposium on Networked System Design and Implementation (NSDI 2015, 2016 (withdrawn))*, *Sixth ACM Symposium on Cloud Computing (SOCC 2015)*, *IEEE International Conference on Distributed Systems (ICDCS 2013) Special Panel on Green Computing*, *USENIX/ACM Symposium on Networked System Design and Implementation (NSDI 2013)*, *Third ACM Symposium on Cloud Computing (SOCC 2012)*, *2012 ACM Cloud Computing Security Workshop (CCSW 2012)*, *7th ACM Symposium on Information, Computer, and Communications Security (ASIACCS 2012)*, *18th Network and Distributed System Security Symposium (NDSS 2012)*, *ACM Cloud Computing Security Workshop (CCSW 2011)*, *Second ACM Symposium on Cloud Computing (SOCC 2011, program co-chair)*, *9th USENIX Symposium on File and Storage Technologies (FAST 2011)*, *First ACM Symposium on Cloud Computing (SOCC 2010)*; *International Conference on Testbeds and Research Infrastructures for the Development of Networks (TridentCom 2010, program co-chair)*; *International Conference on Autonomic Computing (ICAC 2010)*; *ACM Symposium on Operating Systems Principles (SOSP 2009, light committee)*, *Workshop on Automated Control for Datacenters and Clouds (ACDC09, program co-chair)*; *First Workshop on Hot Topics in Cloud Computing (HotCloud 2009)*; *Workshop on Power Aware Computing and Systems (HotPower 2009)*; *Workshop on Managed Multi-Core Systems (MMCS 2008)*; *Third Workshop on Machine Learning in Systems (SysML08)*, *Third Workshop on Economics of Networked Systems (NetEcon 2008)*, *USENIX Technical Conference 2008*, *USENIX/ACM Symposium on Networked System Design and Implementation (NSDI 2008)*, *USENIX Technical Conference 2007 (program co-chair)*, *Second Workshop on Machine Learning in Systems (program co-chair, SysML07)*, *First Workshop on Economics of Networked Systems (NetEcon 2006, program co-chair)*, *USENIX Technical Conference 2006*, *International Conference on Autonomic Computing 2006*, *WWW 2006 (deputy vice-chair for Performance, Reliability, and Scalability)*, *Supercomputing 2005 (program subchair for system software)*, *Third Workshop on Economics of Peer-to-Peer Systems (EconP2P 2005)*, *ACM SIGMETRICS 2004*, *International Conference on Autonomic Computing (ICAC-04)*, *IEEE International Symposium on High-Performance Distributed Computing (HPDC-13, 2004)*, *3rd*

USENIX Conference on File and Storage Technologies (FAST 2004), First USENIX/ACM Symposium on Networked System Design and Implementation (NSDI 2004), 2003 Workshop on Network I/O (NICEL/SIGCOMM), 2003 Workshop on Hot Topics in Operating Systems (HotOS-IX), 2003 Conference on File and Storage Technologies (FAST program chair), 2002 Seventh International Workshop on Internet Content Caching and Distribution (program chair), 2002 Conference on File and Storage Technologies (FAST), 2001 IEEE International Conference on Distributed Systems (ICDCS), 2001 Sixth International Workshop on Web Caching and Content Delivery (WCW-6), 2001 World-Wide Web Conference (WWW10), 2000 World Wide Web Conference (WWW9), 1999 Seventh Workshop on Hot Topics in Operating Systems (HotOS-VII), 1999 World Wide Web Conference (WWW8), 1998 International Performance and Dependability Symposium (IPDS), 1997 ACM Symposium on Operating Systems Principles (SOSP).

Conference steering committees: *USENIX Conference on File and Storage Technologies (FAST), 2003-2007, Workshop on Economics of Networked Systems (NetEcon, 2006-2007); Workshop on Machine Learning in Systems (SysML), 2007-2008; International Workshop on Internet Content Caching and Distribution (2002-2006).*

Other conference organizing: *2004 IEEE Computer Communications Workshop (CCW), 1999 ACM Symposium on Operating Systems Principles (SOSP).*

Reviewer for grant funding programs and leading conferences and journals in operating systems, distributed systems, Internet technologies, storage systems, and computer architecture.

Technical advisory boards: Silverback Systems (2002-2006), Blue Stripe Software (2008-2015).

Consulting: Various clients. Testifying expert witness: Latham and Watkins 2006-2008 (Veritas/Symantec Inc.); Kirkland and Ellis 2008-2009 (Limelight Networks); Quinn Emanuel 2010-2011 (Google), 2011-2012 (Motorola), 2012-2013 (MotionPoint), 2012-2014 (Samsung), 2013-2014 (Symantec); Oblon Spivak LLP 2014-2015 (Oracle/NetApp); Kecker Van Nest & Peters 2016 (Arista Networks).

Refereed Journal Publications

J. Aikat, A. Akella, J. Chase, A. Juels, M. Reiter, T. Ristenpart, V. Sekar, M. Swift. **Rethinking Security in the Era of Cloud Computing.** *IEEE Security & Privacy.* 15(3) pages 60-69, 2017.

M. Berman, J. Chase, L. Landweber, A. Nakao, M. Ott, D. Raychaudhuri, R. Ricci, I. Seskar. **GENI: A Federated Testbed for Innovative Network Experiments.** *Computer Networks.* 61(1) pages 5-23, March 2014.

L. Ramakrishnan, D. Gannon, D. Nurmi, R. Wolski, J. Chase. **Deadline-Sensitive Workflow Orchestration Without Explicit Resource Control.** *Journal of Parallel and Distributed Computing.* 71(3) pages 343-353, (Elsevier). March 2011.

S. Anastasiadis, R. Wickremesinghe, and J. Chase. **Rethinking FTP: Aggressive Block Reordering for Large File Transfers.** *ACM Transactions on Storage (TOS),* 4(4):1-27, January 2009.

A. Yumerefendi and J. Chase. **Strong Accountability for Network Storage.** *ACM Transactions on Storage (TOS),* 3(3), October 2007. Special issue: selected papers from the *Sixth USENIX Symposium on File and Storage Technologies (FAST).*

R. Sharma, C. Bash, C. Patel, R. Friedrich, and J. Chase. **Balance of Power: Dynamic Thermal Management for Internet Data Centers.** *IEEE Internet Computing,* 9(1): 42-49, January 2005.

S. Anastasiadis, S. Gadde, and J. Chase. **Scale and Performance in Semantic Storage Management of Data Grids.** *Springer-Verlag International Journal on Digital Libraries (IJDL), Special Issue on Semantic Web and Science Data Interoperation,* 5(2):84-98, April 2005.

L. Toma, R. Wickremesinghe, L. Arge, J. Chase, J. Vitter, P. Halpin, and D. Urban. **Flow Computation on Massive Grids.** *Geoinformatica,* 7(4), December 2003.

R. Wickremesinghe, L. Arge, J. Chase, and J. Vitter. **Efficient Sorting Using Registers and Caches.** *ACM Journal of Experimental Algorithmics (JEA),* 7(1), December 2002.

D. Anderson and J. Chase. **Failure-Atomic File Access in an Interposed Network Storage System.** *Cluster Computing: The Journal of Networks, Software Tools, and Applications,* 5(4):411-419, October 2002.

R. Doyle, J. Chase, S. Gadde, and A. Vahdat. **The Trickle-Down Effect: Web Caching and Server Request Distribution.** Elsevier *Computer Communications*, 25(4): 345-356, March 2002.

D. Anderson, J. Chase, and A. Vahdat. **Interposed Request Routing for Scalable Network Storage.** *ACM Transactions on Computer Systems (TOCS)*, 20(1): 25-48, February 2002.

J. Chase, A. Gallatin, and K. Yocum. **End System Optimizations for High-Speed TCP.** In *IEEE Communications special issue on TCP Performance in Future Networking Environments*, 39(4):68-74, April 2001.

W. Jin, J. Chase, X. Sun. **FastSlim: Prefetch-Safe Trace Reduction for I/O Cache Simulation.** *ACM Transactions on Modeling and Computer Simulation (TOMACS)*, (11)2, April 2001.

S. Gadde, J. Chase, and M. Rabinovich. **Web Caching and Content Distribution: A View from the Interior** (extended version). In *Computer Communications*, 24(2):222-231, February 2001.

M. Rabinovich, J. Chase, S. Gadde, **Not All Hits Are Created Equal: Cooperative Proxy Caching Over a Wide Area Network** (extended version). In *Journal of Computer Networks*, 30(2), October 1998.

J. Chase, H. Levy, M. Feeley, and E. Lazowska. **Sharing and Protection in a Single Address Space Operating System.** In *ACM Transactions on Computer Systems (TOCS)*, November 1994.

Major Conference Publications

Works in this category are refereed standard-length conference papers (10-16 pages) presented in conferences with acceptance ratios below 30%.

B. Xie, Y. Huang, J. Chase, J.Y. Choi, S. Klasky, J. Lofstead, S. Oral. **Predicting Output Performance of a Petascale Supercomputer.** In *Proceedings of the 26th International Symposium on High-Performance Parallel and Distributed Computing (HPDC 2017)*. Washington DC, June 2017.

P. Misra, J. Chase, J. Gehrke, A. Lebeck. **Enabling Lightweight Transactional Persistent Memory with Precision Time.** In *Proceedings of the ACM Symposium on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2017)*. April 2017.

Y. Zhai, L. Yin, J. Chase, T. Ristenpart, M. Swift. **CQSTR: Securing Cross-Tenant Applications with Cloud Containers.** In *Proceedings of the ACM Symposium on Cloud Computing (SOCC 2016)*. October 2016. (14 pages)

Y. Xin, I. Baldin, A. Mandal, P. Ruth, J. Chase. **Towards an Experimental LegoLand: Slice Modification and Recovery in the ExoGENI Testbed.** In *TridentCom: International Conference on Testbeds and Research Infrastructures for the Development of Networks and Communities*. June 2016. Published as *Springer Lecture Notes of the Institute for Computer Sciences (LNICST), Social Informatics and Telecommunications Engineering* Volume 177, pp. 35-45.

A. Mandal, P. Ruth, I. Baldin, Y. Xin, C. Castillo, G. Juve, M. Runge, E. Deelman, J. Chase. **Adapting Scientific Workflows on Networked Clouds Using Proactive Introspection.** In *the 8th IEEE/ACM International Conference on Utility and Cloud Computing (UCC 2015)*. December 2015.

M. Brinn, N. Bastin, A. Bavier, M. Berman, J. Chase, R. Ricci. **Trust as the Foundation of Resource Exchange in GENI.** *TridentCom: 10th EAI International Conference on Testbeds and Research Infrastructures for the Development of Networks and Communities*. June 2015. (9 pages)

I. Baldine, Y. Xin, A. Mandal, P. Ruth, A. Yumerefendi, and J. Chase. **ExoGENI: A Multi-Domain Infrastructure-as-a-Service Testbed.** *TridentCom: International Conference on Testbeds and Research Infrastructures for the Development of Networks and Communities*. June 2012.

B. Xie, J. Chase, D. Dillow, O. Drokin, S. Klasky, S. Oral, and N. Podhorszki. **Characterizing Output Bottlenecks on a Supercomputer.** *IEEE International Conference for High-Performance Computing, Networking, Storage, and Analysis (SC12)*. November 2012.

H. Lim, J. Chase, S. Babu. **Automated Control for Elastic Storage.** In *IEEE International Conference on Autonomic Computing (ICAC)*, June 2010.

P. Shivam, V. Marupadi, J. Chase, T. Subramaniam, S. Babu. **Cutting Corners: Workbench Automation for Server Benchmarking**. In *USENIX Technical Conference*, June 2008.

A. Yumerefendi and J. Chase. **Strong Accountability for Network Storage**. In the *Sixth USENIX Symposium on File and Storage Technologies (FAST)*, March 2007. Acceptance ratio: 19/98.

L. Ramakrishnan, L. Grit, A. Iamnitchi, D. Irwin, A. Yumerefendi, J. Chase. **Toward a Doctrine of Containment: Grid Hosting with Adaptive Resource Control**. *Supercomputing* 2006. November 2006. Acceptance ratio: 54/239.

P. Shivam, S. Babu, J. Chase. **Active and Accelerated Learning of Cost Models for Optimizing Scientific Applications**. *International Conference on Very Large Data Bases (VLDB)*, September 2006.

P. Ranganathan, D. Irwin, J. Chase. **Enclosure-Level Power Management for Dense Blade Servers**. *International Symposium on Computer Architecture (ISCA)*, June 2006. Acceptance ratio: 31/229.

P. Shivam, S. Babu, J. Chase. **Learning Performance Models in Network Utilities**. In *IEEE International Conference on Autonomic Computing (ICAC)*, June 2006. Acceptance ratio: 26/120.

J. Moore, J. Chase, P. Ranganathan. **Weatherman: Automated, Online, and Predictive Thermal Mapping and Management for Data Centers**. In *IEEE International Conference on Autonomic Computing (ICAC)*, June 2006. Acceptance ratio: 26/120.

D. Irwin, J. Chase, L. Grit, A. Yumerefendi, D. Becker, K. Yocum. **Sharing Networked Resources with Brokered Leases**. In *USENIX Technical Conference*, June 2006. Acceptance ratio: 21/153.

M. Karlsson, C. Karamanolis, J. Chase. **Controllable Fair Queuing for Meeting Performance Goals**. In *Performance 2005*, IFIP/Elsevier, October 2005.

S. Anastasiadis, R. Wickremisinghe, J. Chase. **Lerna: An Active Storage Framework for Flexible Data Access and Management**. *Fourteenth International Symposium on High Performance Distributed Computing (HPDC-14)*, July 2005. Acceptance ratio: 24/153.

J. Moore, J. Chase, P. Ranganathan. **Making Scheduling "Cool": Temperature-Aware Workload Placement in Data Centers**. In the *2005 USENIX Annual Technical Conference (USENIX '05)*, April 2005. Acceptance ratio: 24/118.

I. Cohen, M. Goldszmidt, T. Kelly, J. Symons, and J. Chase. **Correlating Instrumentation Data to System States: A Building Block for Automated Diagnosis and Control**. In the *Sixth Symposium on Operating System Design and Implementation (OSDI)*, December 2004. Acceptance ratio: 27/193.

W. Jin, J. Chase, and J. Kaur. **Interposed Proportional Sharing for a Storage Service Utility**. In the *Joint International Conference on Measurement and Modeling of Computer Systems (ACM SIGMETRICS/Performance)*, June 2004. Acceptance ratio: 33/265.

D. Irwin, J. Chase, and L. Grit. **Balancing Risk and Reward in Market-Based Task Scheduling**. In the *Thirteenth International Symposium on High Performance Distributed Computing (HPDC-13)*, June 2004. Acceptance ratio: 24/153.

M. Ripeanu, M. Bowman, J. Chase, I. Foster, and M. Milenkovic. **Globus and PlanetLab Resource Management Solutions Compared**. In the *Thirteenth International Symposium on High Performance Distributed Computing (HPDC-13)*, June 2004. Acceptance ratio: 24/153.

S. Anastasiadis, R. Wickremisinghe, J. Chase. **Circus: Opportunistic Block Reordering for Scalable Content Servers**. In the *Third USENIX Conference on File and Storage Technologies (FAST)*, March 2004. Acceptance ratio: 18/72.

K. Keeton, C. Santos, D. Beyer, J. Chase, J. Wilkes. **Designing for Disasters**. In the *Third USENIX Conference on File and Storage Technologies (FAST)*, March 2004. Acceptance ratio: 18/72.

Y. Fu, J. Chase, B. Chun, S. Schwab, and A. Vahdat. **SHARP: An Architecture for Secure Resource Peering**. In the *19th ACM Symposium on Operating Systems Principles (SOSP)*, October 2003. Acceptance ratio: 22/128.

J. Chase, L. Grit, D. Irwin, J. Moore, and S. Sprenkle. **Dynamic Virtual Clusters in a Grid Site Manager**. In the *Twelfth International Symposium on High Performance Distributed Computing (HPDC-12)*, June 2003. Acceptance ratio: 25/121.

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