

Curriculum Vitae

Zachary N. J. Peterson

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Current Positions

Senior Security Analyst and Director of the Technology Research and Intellectual Property Services (TRIPS) division at Independent Security Evaluators, Baltimore, MD.

Assistant Research Scientist of Computer Science, The Johns Hopkins University, Baltimore, MD.

Education

- PhD 2006 The Johns Hopkins University, Computer Science
Dissertation: Toward Regulatory Compliant Storage Systems
Research: Systems designed to comply with federal electronic record management legislation. Developing technologies include time-shifting versioning, secure deletion, and authenticated audit trails.
Advisor: Professor Randal Burns
- MS 2005 The Johns Hopkins University Information Security Institute, Security Informatics
Project: Secure Deletion in a Versioning File System
Research: Electronic record and content management policy, digital rights, intellectual property, and privacy issues.
Advisor: Professor Gerry Masson and Professor Aviel Rubin
- MS 2002 University of California, Santa Cruz, Computer Science
Thesis: Data Placement for Copy-on-Write Using Virtual Contiguity
Research: Data placement and allocation policies, MEMS-based storage.
Advisor: Professor Darrell D. E. Long
- BS 2000 University of California, Santa Cruz, Computer Engineering
Liberal arts emphasis in music.

Employment History

- 2008– **The Johns Hopkins University**, *Assistant Research Scientist*, Computer Science, Baltimore, MD.
- 2008 **McDaniel College**, *Adjunct Lecturer*, Mathematics and Computer Science, Westminster, MD.
- 2006– **Independent Security Evaluators**, *Senior Security Analyst*, Baltimore, MD.
- 2005 **Independent Security Evaluators**, *Consultant*, Baltimore, MD.
- 2002–06 **The Johns Hopkins University**, *Graduate Researcher*, Hopkins Storage Systems Lab, Baltimore, MD.
- 2000–02 **University of California, Santa Cruz**, *Graduate Researcher*, Computer Systems Lab, Santa Cruz, CA.
- 2000–02 **International Business Machines**, *Research Associate*, Almaden Research Center, San Jose, CA.
- 1999–00 **eBay Inc.**, *Software Engineering Intern*, Santa Cruz, CA.
- 1999–00 **Education Opportunity Program**, *Tutor*, University of California Santa Cruz, Santa Cruz, CA.
- 1998–99 **NetMind Technologies**, *Software Engineering Associate*, Santa Cruz, CA.
- 1997–98 **@Home Networks**, *Software Engineering Intern*, Redwood City, CA.

Publications

Journals

1. R. Burns and Z. Peterson. Security Constructs for Regulatory Compliant Storage. *Communications of the ACM*, To appear.
2. Z. Peterson and R. Burns. Ext3cow: A Time-Shifting File System for Regulatory Compliance. *ACM Transactions on Storage*, 1(2):190–212, May 2005.

Refereed Conferences

1. G. Ateniese, R. Burns, R. Curtmola, J. Herring, L. Kissner, Z. Peterson and D. Song. Provable Data Possession at Untrusted Stores. In: *Proceedings of the Conference on Computer and Communication Security (CCS)*, ACM, 2007. *Acceptance rate: 18% (55/303)*
2. Z.N.J. Peterson, R. Burns, G. Ateniese and S. Bono. The Design and Implementation of Audit Trails for a Versioning File System. In: *Proceedings of the Conference on File and Storage Technologies (FAST)*, USENIX, 2007. *Acceptance rate: 19% (19/98)*
3. Z.N.J. Peterson, R. Burns, J. Herring, A. Stubblefield and A. Rubin. Secure Deletion for a Versioning File System. In: *Proceedings of the Conference on File and Storage Technologies (FAST)*, USENIX, 2005. *Acceptance rate: 25% (20/125)*
4. B. Hong, S.A. Brandt, D.D.E. Long, E.L. Miller, K.A. Glocer and Z.N.J. Peterson. Zone-Based Shortest Positioning Time First Scheduling for MEMS-Based Storage Devices. In: *Proceedings of the International Symposium on Modeling, Analysis, and Simulation in Computer and Telecommunication Systems (MASCOTS)*, IEEE, 2003. *Acceptance rate: 30%*
5. S.A. Banachowski, Z.N.J. Peterson, E.L. Miller and S.A. Brandt. Intra-File Security for a Distributed File System. In: *Proceedings of the NASA Goddard Conference on Mass Storage Systems and Technologies*, IEEE, 2002. *Acceptance rate: 35%*

Refereed Workshops and Short Papers

1. Z.N.J. Peterson and R. Burns. Building Regulatory Compliant Storage Systems. In: *Proceedings of the Conference on Digital Government Research (dg.o)*, ACM, 2006.
2. R. Burns, Z. Peterson, G. Ateniese and S. Bono. Verifiable Audit Trails for a Versioning File System. In: *Proceedings of the CCS Workshop on Storage Security and Survivability (SSS)*, ACM, 2005.
3. Z.N.J. Peterson, R. Burns and A. Stubblefield. Limiting Liability in a Federally Compliant File System. In: *the PORTIA Workshop on Sensitive Data in Medical, Financial, and Content-Distribution Systems, Privacy, Obligations, and Rights in Technologies of Information Assessment (PORTIA)*, 2004.
4. Z.N.J. Peterson and R.C. Burns. Limiting Liability in a Federally Compliant File System. A Work in Progress at: *the Conference on File and Storage Technologies (FAST)*, USENIX, 2004.
5. Z.N.J. Peterson, S.A. Brandt and D.D.E. Long. Data Placement Based on the Seek Time Analysis of a MEMS-based Storage Device. A Work in Progress at: *the Conference on File and Storage Technologies (FAST)*, USENIX, 2002.

Software Artifacts

The ext3cow file system. Available at <http://www.ext3cow.com>. The ext3cow file system provides an open-source implementation of continuous file versioning and file system snapshot. Ext3cow builds upon the popular ext3 file system the default file system for most Linux distributions. Ext3cow provides a time-shifting interface that permits a real-time and continuous view of data in the past. Our release of ext3cow for the Linux 2.6 kernel was reported on both slashdot.org and digg.com on May 2, 2007, resulting in over 23,000 visits to the Website in a single day. The software has been downloaded over 2,000 times. The ext3cow mailing list for developers and users includes over 50 active members and programmers from the open-source community have contributed to its source and have provided auxiliary tools. Additionally, research projects at UC Berkeley, Columbia, Utah, and UC Santa Cruz build on the versioning features of ext3cow and a startup uses ext3cow as the file system in an object-based storage device.

The Provable Data Possession (PDP) software library. Available at <http://code.google.com/p/provable-data-possession>. Provable Data Possession is a cryptographic library that allows users to store their data at an untrusted server and have probabilistic guarantees that the server possesses the original data. The client needs to store only his cryptographic keys and never has to retrieve the file. PDP uses homomorphic verifiable tags that minimize the amount of server computation, network traffic and block accesses while achieving a strong guarantee of data possession. More details on PDP can be found in the paper: Provable Data Possession at Untrusted Stores.

Teaching

- 2008 McDaniel College, *Instructor*, CSC-3365: Topics in Secure Systems.
- 2007 The Johns Hopkins University, *Invited Lecturer*, 600.442: Security and Privacy in Computing.
- 2007 The Johns Hopkins University, *Invited Lecturer*, 600.419: Storage Systems.
- 2006 The Johns Hopkins University, *Co-Lecturer*, 600.419: Storage Systems.
- 2005 The Johns Hopkins University, *Invited Lecturer*, 600.105: Freshman Experience.
- 2005 The Johns Hopkins University, *Teaching Assistant*, 600.107: Introduction to Programming in Java.
- 2004 The Johns Hopkins University, *Invited Lecturer*, 600.105: Freshman Experience.
- 2002 The Johns Hopkins University, *Teaching Assistant*, 600.419: Storage Systems.

Pending Patents

- 2007 Method and Apparatus for Limiting Access to Sensitive Data. (with S. Bono, M. Green, A. Stubblefield).

Invited Talks

- 2007 "Toward Regulatory Compliant Storage Systems," McDaniel College, *Host*: Prof. Italo Simonelli.
- 2006 "Toward Regulatory Compliant Storage Systems," The Johns Hopkins University Institute for Security Informatics, *Host*: Prof. Gerry Masson.
- 2002 "Virtual Contiguity: Data Placement for a Versioning File System," IBM Almaden Research Center, *Host*: Bernie Lopez.
- 2001 "Storage Technology for High Performance Computing," Lawrence Livermore National Laboratory, *Host*: Steve Louis.

Peer Review and Referee

- 2006 Communications of the ACM
- 2006 IBM Systems Journal
- 2006 Program Committee for the International Workshop on Storage Security and Survivability (StorageSS)
- 2002 USENIX Conference on File and Storage Technologies (FAST)