

KEVIN RAYMOND BOYCE BUTLER

PH.D. Candidate
Department of Computer Science & Engineering
Pennsylvania State University

Office: 344 IST Building
University Park, PA 16802
USA

email: butler@cse.psu.edu
URL: <http://www.kevinbutler.org>

Phone: +1 (814) 865-6245
Fax: +1 (814) 865-3176

Areas of specialization

Storage and Systems Security; Networking Security.

Educational Background

PH.D. in Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA (*expected graduation date: May 2010*)

Advisor: Dr. Patrick McDaniel

M.S. in Electrical Engineering, Columbia University, New York, NY, USA, May 2003

Advisor: Dr. Henning Schulzrinne

B.SC. in Electrical Engineering, Queen's University, Kingston, ON, Canada, May 1999

Academic Appointments

Research Assistant, Department of Computer Science, Pennsylvania State University, Jan. 2005 - present

- **Senior Personnel**, NSF HECURA: Collaborative Research: Secure Provenance in High-End Computing Systems, NSF (CCF), \$307,073, Aug. 2009 - present.
- Funded by NSF HECURA grant 0621429 from Aug. 2006 - present, investigating security of storage systems.
- Funded by NSF grant CNS-0335241 from Aug. 2005 - Aug. 2006, investigating BGP security solutions and large-scale simulation.

Lead Graduate Student, Systems and Internet Infrastructure Security (SIIS) Laboratory, Pennsylvania State University, Sep. 2007 - Dec. 2008

- Administrative and logistical lead student in the SIIS lab. Ran weekly lab meetings of 13 members, met with students individually for mentoring and development of leadership and research skills. Responsible for most daily operational activities in the lab.

Instructor, Department of Electrical Engineering, Pennsylvania State University, Jun.-Aug. 2006

- Instructor for *EE/CSE 458*, the senior undergraduate course on computer networking.

Guest Lecturer, Department of Computer Science, Pennsylvania State University, 2005-present

- *CSE 543 (Computer Security)*: presented lectures on cryptography and public key infrastructures.
- *CSE 597A (Advanced Topics in System Security)*: lectured on virtual machine security.
- *CSE 411 (Operating Systems)*: presented lectures on storage systems.
- *CSE 545 (Advanced Network Security)*: lectured on BGP security.

Teaching Assistant, Stern School of Business, New York University, Fall 2005

- Lectured, graded, and provided logistics for Computer and Network Security course offered for MBA students.

Teaching Assistant, Department of Computer Science and Engineering, Pennsylvania State University, Fall 2004

- Held lab hours and graded for Computer System Architecture course.

Graduate Research Assistant, Department of Computer Science, Columbia University, Oct. 2001 - May 2002

- Worked on SIP security, implementing authentication into the Panasonic PINTL JAIN SIP stack.

Teaching Assistant, Department of Computer Science, Queen's University, Fall 1998

- Held office hours and graded for Introduction to Computer Science course.

Industrial Appointments

Research Intern, Symantec Research Labs, Mountain View, CA, Jun - Aug. 2009

- Examined host-based validation for portable storage devices, and implemented a prototype using embedded Linux.

Research Intern, Seagate Research, Pittsburgh, PA, May - Aug. 2008

- Developed security infrastructures for distributed storage in a home user environment, focussing on distributed access control mechanisms.

Research Intern, AT&T Labs - Research, Florham Park, NJ, Dec. 2003 - Aug. 2004

- Investigated security threats in BGP and created an overview of threats and currently deployed solutions. Developed cryptographic constructions allowing efficient security solutions and performed simulations based on trace data.

Technical Intern, Flarion Technologies, Bedminster, NJ, Summer 2002

- Implemented packet diversion and IP header modification program in BSD for mobile IP packet testing.

Journal Publications & Book Chapters

1. Kevin Butler, Toni Farley, Patrick McDaniel, and Jennifer Rexford. A Survey of BGP Security Issues and Solutions. *Proceedings of the IEEE*. 2009. *To appear*.
2. Patrick Traynor, Kevin Butler, William Enck, Kevin Borders, and Patrick McDaniel. *malnets*: Large-Scale Malicious Networks via Compromised Wireless Access Points. *Journal of Security and Communication Networks (SCN)*. 2009. *To appear*.
3. Kevin Butler, Sunam Ryu, Patrick Traynor, and Patrick McDaniel. Leveraging Identity-based Cryptography for Node ID Assignment in Structured P2P Systems. *IEEE Transactions on Parallel and Distributed Systems*, 20(12), pg. 1803-1815, December 2009.
4. Kevin Butler, William Enck, Patrick Traynor, Jennifer Plasterr, and Patrick McDaniel, Privacy Preserving Web-Based Email. *Algorithms, Architectures and Information Systems Security*, Statistical Science and Interdisciplinary Research. World Scientific Computing, November 2008.
5. Patrick McDaniel, William Aiello, Kevin Butler, and John Ioannidis, Origin Authentication in Interdomain Routing. *Computer Networks*, 50(16), pg. 2953-2980, 14 November 2006.

Conference Publications

6. Thomas Moyer, Kevin Butler, Joshua Schiffman, Patrick McDaniel, and Trent Jaeger. Scalable Web Content Attestation. *25th Annual Computer Security Applications Conference (ACSAC 2009)*, December 2009. *To appear*.
7. William Enck, Kevin Butler, Thomas Richardson, Patrick McDaniel, and Adam Smith. Defending Against Attacks on Main Memory Persistence. *24th Annual Computer Security Applications Conference (ACSAC 2008)*, Anaheim, CA, USA. December 2008.
8. Kevin Butler, Stephen McLaughlin, and Patrick McDaniel. Rootkit Resistant Disks. *15th ACM Conference on Computer and Communications Security (CCS'08)*, Alexandria, VA, USA. October 2008.
9. Patrick Traynor, Kevin Butler, William Enck, and Patrick McDaniel. Realizing Massive-Scale Conditional Access Systems Through Attribute-Based Cryptosystems. *15th Annual Network and Distributed System Security Symposium (NDSS'08)*, San Diego, CA, USA. February 2008.
10. Dhananjay Bapat, Kevin Butler, and Patrick McDaniel. Towards Automatic Privilege Separation. *3rd International Conference on Information Systems Security (ICISS 2007)*, Delhi, India. December 2007.
11. Lisa Johansen, Kevin Butler, Michael Rowell, and Patrick McDaniel. Email Communities of Interest. *Fourth Conference on Email and Anti-Spam (CEAS 2007)*, Mountain View, CA, USA. August 2007.
12. Anusha Sriraman, Kevin Butler, Patrick McDaniel, and Padma Raghavan. Analysis of the IPv4 Address Space Delegation Structure. *IEEE Symposium on Computers and Communications (ISCC'07)*, Aveiro, Portugal, July 2007.

13. Sunam Ryu, Kevin Butler, Patrick Traynor, and Patrick McDaniel. Leveraging Identity-based Cryptography for Node ID Assignment in Structured P2P Systems. *3rd IEEE International Symposium on Security in Networks and Distributed Systems (SSNDS'07)*, Niagara Falls, ON, Canada, May 2007.
14. Kevin Butler, Patrick Traynor, William Enck, Jennifer Plasterr, and Patrick McDaniel. Privacy Preserving Web-Based Email. *2nd International Conference on Information Systems Security (ICISS 2006)*, Kolkata, India, December 2006.
15. Kevin Butler, William Aiello, and Patrick McDaniel. Optimizing BGP Security by Exploiting Path Stability. *13th ACM Conference on Computer and Communications Security (CCS'06)*, Alexandria, VA, USA, November 2006.
16. Trent Jaeger, Kevin Butler, David King, Serge Hallyn, Joy Latten, and Xiolan Zhang. Leveraging IPsec for Mandatory Per-Packet Access Control. *2nd IEEE Communications Society/CreateNet International Conference on Security and Privacy in Communication Networks (SecureComm'06)*, August 2006. Baltimore, MD, USA.
17. Kevin Butler and Patrick McDaniel, Understanding Mutable Internet Pathogens, or How I Learned to Stop Worrying and Love Parasitic Behavior. *1st International Conference on Information Systems Security (ICISS 2005)*, December 2005. Kolkata, India.

Workshop Publications

18. Kevin Butler and Petros Efstathopoulos. U Can't Touch This: Block-Level Protection for Portable Storage. *International Workshop on Software Support for Portable Storage (IWSSPS 2009)*, October 2009. Grenoble, France.
19. Kevin Butler, William Enck, Harri Hursti, Stephen McLaughlin, Patrick Traynor, and Patrick McDaniel. Systemic Issues in the Hart InterCivic and Premier Voting Systems: Reflections Following Project EVEREST. *2008 USENIX/ACCURATE Electronic Voting Workshop (EVT'08)*, July 2008. San Jose, CA, USA.
20. Kevin Butler, Stephen McLaughlin, and Patrick McDaniel. Non-Volatile Memory and Disks: Avenues for Policy Architectures. *1st Computer Security Architectures Workshop (CSAW 2007)*, November 2007. Fairfax, VA, USA.
21. Shiva Chaitanya, Kevin Butler, Anand Sivasubramaniam, Patrick McDaniel and Murali Vilayanur. Design, implementation and evaluation of security in iSCSI-based network storage systems. *2nd International Workshop on Storage Security and Survivability (StorageSS 2006)*, October 2006. Alexandria, VA, USA.
22. Kevin Butler and Patrick McDaniel, Testing Large Scale BGP Security in Replayable Network Environments. *DETER Community Workshop on Cyber Security Experimentation and Test*, June 2006. Arlington, VA, USA.
23. Sophie Qiu, Kevin Butler, and Patrick McDaniel, BGPRV: Retrieving and Processing BGP Data with Efficiency and Convenience. *DETER Community Workshop on Cyber Security Experimentation and Test*, June 2006. Arlington, VA, USA.

Technical Reports

24. Kevin Butler and Petros Efstathopoulos. U Can't Touch This: Block-Level Protection for Portable Storage. Technical Report Symantec-SRL/MV2009-11, Symantec Research Labs, Mountain View, CA, June 2009.
25. Kevin Butler, Stephen McLaughlin, Thomas Moyer, Joshua Schiffman, Patrick McDaniel, and Trent Jaeger. Firma: Disk-Based Foundations for Trusted Operating Systems. Technical Report NAS-TR-0114-2009, Networking and Security Research Center, Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA, May 2009.
26. Kevin Butler, Stephen McLaughlin, Thomas Moyer, Patrick McDaniel, and Trent Jaeger. Switch-Blade: Policy-Driven Disk Segmentation. Technical Report NAS-TR-0098-2008, Networking and Security Research Center, Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA, November 2008.
27. Kevin Butler, Stephen McLaughlin, Patrick McDaniel, and Youngjae Kim. Autonomously Secure Disks. Technical Report NAS-TR-0072-2007, Network and Security Research Center, Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA, May 2007. (*Updated September 2007.*)
28. Lisa Johansen, Kevin Butler, William Enck, Patrick Traynor, and Patrick McDaniel. Grains of SANs: Building Storage Area Networks from Memory Spots. Technical Report NAS-TR-0060-2007, Network and Security Research Center, Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA, January 2007.
29. Luke St. Clair, Lisa Johansen, Kevin Butler, William Enck, Matthew Pirretti, Patrick Traynor, Patrick McDainel, and Trent Jaeger. Password Exhaustion: Predicting the End of Password Usefulness. Technical Report NAS-TR-0030-2006, Network and Security Research Center, Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA, May 2006. (*Updated January 2007.*)

Other Publications

30. Patrick McDaniel, Kevin Butler, William Enck, Harri Hursti, Stephen McLaughlin, Patrick Traynor, Matt Blaze, Adam Aviv, Pavol Cerny, Sandy Clark, Eric Cronin, Gaurav Shah, Micah Sherr, Giovanni Vigna, Richard Kemmerer, David Balzarotti, Greg Banks, Marco Cova, Viktoria Felmetsger, William Robertson, Fredrik Valeur, Joseph Lorenzo Hall, and Laura Quilter, EVEREST: Evaluation and Validation of Election-Related Equipment, Standards and Testing. Public Report, Ohio Secretary of State 2007.
31. Kevin Butler, 17th USENIX Security Symposium Conference Summaries. *USENIX ;login Magazine*, December 2007.
32. Kevin Butler, 16th USENIX Security Symposium Conference Summaries. *USENIX ;login Magazine*, December 2006.
33. Kevin Butler, 15th USENIX Security Symposium Conference Summaries. *USENIX ;login Magazine*, December 2005.

Professional Service

Program Committee Member, 5th International Conference on Internet Monitoring and Protection (ICIMP 2010), Barcelona, Spain, May 2010.

Program Committee Member, 5th International Conference on Availability, Reliability and Security (ARES 2010), Krakow, Poland, February 2010.

Program Committee Member, 5th International Conference on Information Systems Security (ICISS 2009), Kolkata, India, December 2009.

Program Committee Member, 1st IEEE International Workshop on Software Security Process, Vancouver, BC, Canada, August 2009.

Program Committee Member, 5th International Workshop on Security in Systems and Networks (SSN 2009), Rome, Italy, May 2009.

Program Committee Member, 2nd International Conference on International Conference on Information Security and Assurance (ISA 2009), Seoul, Korea, June 2009.

Program Committee Member, 4th International Conference on Availability, Reliability and Security (ARES 2009), Fukuoka, Japan, March 2009.

Program Committee Member, 4th International Conference on Information Systems Security (ICISS 2008), Hyderabad, India, December 2008.

Program Committee Member, 2008 Conference on Future Generation Communication and Networking (FGCN 2008), Hainan Island, China, December 2008.

Program Committee Member, 3rd International Workshop on Security (IWSEC 2008), Kagawa, Japan, November 2008.

Session Chair, 15th ACM Conference on Computer and Communications Security (CCS'08), Alexandria, VA, USA, October 2008.

Session Chair, 2008 ACM Workshop on Storage Security and Survivability (StorageSS'08), Fairfax, VA, USA, October 2008.

Program Committee Member, 2nd IEEE International Workshop on Security in Software Engineering (IWSSE 2008), Turku, Finland, July 2008.

Program Committee Member, 38th IEEE/IFIP Conference on Dependable Systems and Networks (DSN 2008), Fast Abstracts Track, Anchorage, AK, June 2008.

Submissions Chair & Session Chair, 29th IEEE Symposium on Security and Privacy (S&P'08), Oakland, CA, USA, May 2008.

Program Committee Member, 2nd International Workshop on Secure Software Engineering (SecSE'08), Barcelona, Spain, March 2008.

Program Committee Member, 3rd International Conference on Availability, Reliability and Security (ARES 2008), Barcelona, Spain, March 2008.

Publicity Co-Chair and Program Committee Member, First International Conference on Information Security and Assurance (ISA 2008), Busan, Korea, March 2008.

Program Committee Member, 14th ACM Conference on Computer and Communications Security (CCS), *Industry and Government Track*, Alexandria, VA, November 2007.

Program Committee Member, 2007 Conference on Future Generation Communication and Networking (FGCN 2007), Jeju Island, Korea, December 2007.

Submissions & Website Chair and Program Committee Member, 3rd International Conference on Information Systems Security (ICISS 2007), Delhi, India, December 2007.

Program Committee Member, 2nd International Workshop on Security (IWSEC 2007), Nara,

Japan, October 2007.

Program Committee Member, 1st IEEE International Workshop on Security in Software Engineering (IWSSE 2007), Beijing, China, July 2007.

Program Committee Member, 2nd International Conference on Availability, Reliability and Security (AREs), Vienna, Austria, April 2007.

Program Committee Member, 3rd International Workshop on Security in Systems and Networks (SSN'07), Long Beach, CA, March 2007.

Program Committee Member, 11th ACM Conference on Computer and Communications Security (CCS), *Industry Track*, Alexandria, VA, November 2004.

Journal & Book Reviewing

ACM Transactions on Information and System Security (TISSEC), 2009, 2008, 2006; ACM Transactions on Internet Technologies (TOIT), 2009; IEEE Transactions on Computers (TC), 2009; International Journal of Security and Networks (IJSN), 2009, 2007; The Computer Journal (Oxford), 2009; ACM/IEEE Transactions on Networking (TON), 2008; IEEE Transactions on Parallel and Distributed Systems (TPDS), 2008; Wireless Personal Communications, 2008; IEEE Communications Surveys and Tutorials, 2007; IEEE Transactions on Software Engineering (TSE), 2007; Software: Practice and Experience, 2007; Computer Networks, 2005; Handbook of Information Security, 2004.

Conference & Workshop Reviewing

ACM Conference on Computer and Communications Security (CCS), 2009, 2008, 2006; IFCA International Conference on Financial Cryptography and Data Security (FC), 2010, 2008, 2007; Information Security Conference (ISC), 2009; USENIX Security Symposium, 2009, 2008, 2007, 2006, 2004; ACM Symposium on Access Control Models and Technologies (SACMAT), 2009, 2008, 2006; IEEE Symposium on Security and Privacy (S&P), 2009, 2008, 2007; ISOC Symposium on Network and Distributed Systems Security (NDSS), 2009, 2007; IEEE GLOBECOM, 2008; IFIP Conference on Data and Applications Security (DBSEC), 2008, 2006; USENIX Conference on File and Storage Technologies (FAST), 2008; Annual Computer Security Applications Conference (ACSAC), 2007, 2006, 2005; IEEE International Conference on Computer Engineering and Systems (ICCES), 2007; USENIX Workshop on Hot Topics in Security (HotSec), 2007; IEEE International Conference on Distributed Computing Systems (ICDCS), 2007; IEEE Sarnoff Symposium, 2007; IEEE/IFIP International Conference on Dependable Systems and Networks (DSN), 2007; IEEE INFOCOM, 2007; ACM International Workshop on Storage Security and Survivability (StorageSS), 2006; International Workshop on Security (IWSEC), 2006; International Conference on Emerging Trends in Computer Science (ETRICS), 2006; International Conference on Applied Cryptography and Network Security (ACNS), 2006; European Symposium on Research in Computer Security (ESORICS), 2005.

Honors & Awards

Winner, Symantec Intern Project Showcase Competition, Symantec Corporation, August 2009.

Graduate Research Assistant Award, Computer Science and Engineering Department, Pennsylvania State University, 2009.

Symantec Graduate Fellowship, Symantec Research Labs, 2009-2010.
Student Stipend Award, USENIX Association, July 2009.
Student Travel Grant, 15th ACM Conference on Computer and Communications Security, November 2008. Supported by IBM Research, ARO, and ACM.
Student Stipend Award, USENIX Association, July 2008.
Student Travel Grant, 29th IEEE Symposium on Security and Privacy, May 2008. Supported by NSF, IARPA, and ARO.
Special Award of Meritous Service, Third International Conference on Information Systems Security, December 2007.
IUSSTF Travel Award, Indo-US Science and Technology Forum, October 2007.
Student Stipend Award, USENIX Association, July 2007.
University Graduate Fellowship, Pennsylvania State University, 2006.
Student Stipend Award, USENIX Association, July 2005.
C. Norwood Wherry Memorial Graduate Fellowship, Pennsylvania State University, 2004-2005.

Industrial Experience

Research Scientist, Telcordia Technologies, Morristown, NJ, Sep. 2000 - Nov. 2001

- Created a network engineering and operations environment in a hybrid fibre-coax lab designed to emulate a cable plant. Configured and maintained network elements in a lab environment including configuring routing protocols, cable and IP management, voice over IP and hardware installation; gained familiarity with DOCSIS and PacketCable protocols, HFC plant issues and a variety of cable equipment (CMTS, taps, filters etc). Configured multicasting in lab environment, address translation and access lists for communication with external network elements; also assisted in configuring and provisioning access to SGCP call agent. Researched routing alternatives in multiple service provider environments. Researched service assurance methodologies for multiple service providers accessing a common network.

Technical Specialist, UUNET, Toronto, ON, May 1999 - Aug. 2000

- Monitored and troubleshot intermediate and backbone connections across the UUNET Canadian network. Acted as a support specialist for high-speed dedicated line Internet customers and supervised front line support, acting as higher level support when necessary. Gained experience with internetworking, IP, frame relay, WAN protocols and UNIX shell scripting and configured edge and backbone routers, also learned network security techniques (tracking DoS attacks, spam, network abuse). Supported web clients by troubleshooting scripts and admin problems using Apache, Zeus and IIS.

Summer Intern, Royal Bank of Canada, Toronto, ON, Summer 1997, 1998

- Reported on potential financing opportunities by compiling database of companies in Life Science and Knowledge-Based Industries, performing financial and technical analyses on these companies. Worked in Systems and Technology department, rewrote reporting applications and ported them from mainframe and OS/2 environments to Windows platform.

Presentations & Invited Talks

1. U Can't Touch This: Protections for Portable Storage. *IWSSPS 2009*, Grenoble, France, October 2009.
2. FlowStor: Preserving Information Flow on Portable Storage Devices. *Symantec Corporation*, Mountain View, CA, USA, August 2009.
3. Leveraging Emerging Disk Functionality for New Security Services. *Symantec Research Labs*, Mountain View, CA, USA, June 2009.
4. Rootkit-Resistant Disks. *CCS'08*, Alexandria, VA, USA, October 2008.
5. Experimenting with BGP Security Mechanisms Using the DETER Framework. *Boeing Integrated Defense*, Philadelphia, PA, USA, October 2008.
6. Terabyte Home Security and Access Control (intern talk). *Seagate Research*, Pittsburgh, PA, USA, August 2008.
7. Towards Automated Privilege Separation. *ICISS 2007*, Delhi, India, December 2007.
8. Non-Volatile Memory and Disks: Avenues for Policy Architectures. *CSAW 2007*, Fairfax, VA, USA, November 2007.
9. Autonomously Secure Disks. *Software Reading Group, University of Michigan*, Ann Arbor, MI, USA, September 2007.
10. Leveraging Non-Volatile Memory for Storage Security. *2007 USENIX Security Symposium, Works in Progress*, Boston, MA, USA, August 2007.
11. Analysis of the IPv4 Address Delegation Structure. *ISCC 2007*, Aveiro, Portugal, July 2007.
12. Performance Optimizations of IPsec for Storage. *2007 SNIA Summer Security Summit*, Pittsburgh, PA, June 2007.
13. Optimizing BGP Security by Exploiting Path Stability. *CCS'06*, Alexandria, VA, November 2006.
14. Threats and Attacks in Interdomain Routing. *P2INGS Quarterly Meeting*, Tempe, AZ, February 2004.
15. Network Operations in Tier-1 Internet Service Providers. *Columbia University*, New York, NY, March 2001.
16. Network Operations in Tier-1 Internet Service Providers. *Telcordia Technologies*, Morristown, NJ, August 2000.