# THOMAS MOYER

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Secure, Resilient Systems and Technology
244 Wood Street
Lexington, MA 02420

## EDUCATION

**The Pennsylvania State University** University Park, PA
PhD, Computer Science and Engineering, December 2011
Advisor: Dr. Patrick D. McDaniel
Dissertation Title: *Building Scalable Document Integrity Systems*

**The Pennsylvania State University** University Park, PA
MS, Computer Science and Engineering, 2009
Advisor: Dr. Patrick D. McDaniel
Thesis Title: *Scalable Web Content Attestations*

**The Pennsylvania State University** University Park, PA
B.S., Computer Engineering, 2006

## INDUSTRIAL APPOINTMENTS

**Technical Staff**, September 2011 to Present
*Cyber Systems and Technology Group*, MIT Lincoln Laboratory, Lexington, MA
Worked on secure system design and prototyping.
Developed prototype for protected, mobile, satellite communications terminal, including addressing information assurance requirements for multiple organizations.
Developed understanding of certification and accreditation processes used to certify information systems.
Participated in blue-team threat assessment for legacy computer systems.
Supported DoD ASD(R&E) Information Systems and Cyber Technologies office as subject matter expert in cyber security.
Developed secure data provenance architectures for large-scale enterprise systems.

**Summer Research Intern AT&T**, Summer 2007
*Internet and Networking Systems Research Center*, AT&T Labs Research, Florham Park, NJ
Mentor: Dr. Subhabrata Sen
Worked on problems in configuration management.
Assisted in developing internal tool for creating configurations.

**Systems Administrator**, March 2004 to Summer 2007
*Geodynamics Research Group*, The Pennsylvania State University, University Park, PA
Supervised by Dr. Kevin Furlong
Responsible for maintaining and upgrading systems and infrastructure.
Implemented an automated, platform independent, remote backup system.
Assisted with some minimal scientific programming for research.

## ACADEMIC APPOINTMENTS

**Research Assistant**, Summer 2008 to Present
*The Pennsylvania State University*, University Park, PA
Advisor: Dr. Patrick D. McDaniel
Worked on problems in virtual machine security.

Utilized technologies for virtualization and trusted hardware to develop secure computing applications.
Worked on problems in Web security.

**Research Assistant**, Fall 2007 to Spring 2008
*The Pennsylvania State University*, University Park, PA
Advisor: Dr. Patrick D. McDaniel
Mentor: Dr. Subhabrata Sen
Worked on problems in configuration management.
Assisted in developing/testing tool for creating router configurations.

**Instructor**, Spring 2007
*The Pennsylvania State University*, University Park, PA
Department of Computer Science Engineering, Pennsylvania State University
Introduction to Algorithmic Processes (CMPSC 101)
Instructed students in program design and creation using the MS Visual Basic programming language.

## PROFESSIONAL ACTIVITIES

**Organizing Committee**
*2017:* IEEE Symposium on Security and Privacy (Oakland)
*2016:* Annual Computer Security Applications Conference (ACSAC)
*2015:* Annual Computer Security Applications Conference (ACSAC)

**Program Committee**
*2017:* Annual Computer Security Applications Conference (ACSAC), International Conference on Availability, Reliability and Security (ARES)
*2016:* Annual Computer Security Applications Conference (ACSAC), International Conference on Availability, Reliability and Security (ARES), MILCOM
*2015:* Annual Computer Security Applications Conference (ACSAC), International Conference on Availability, Reliability and Security (ARES)
*2014:* Annual Computer Security Applications Conference (ACSAC), International Conference on Availability, Reliability and Security (ARES)
*2013:* Annual Computer Security Applications Conference (ACSAC), International Conference on Availability, Reliability and Security (ARES)
*2012:* Annual Computer Security Applications Conference (ACSAC), International Conference on Availability, Reliability and Security (ARES)

**Reviewer** (Years removed for brevity)
IEEE Symposium on Security and Privacy (Oakland)
Annual Computer Security Applications Conference (ACSAC)
ACM Computer and Communications Security Conference (CCS)
USENIX Workshop on Hot Topics in Security (HotSec)
ACM Symposium on Access Control Models and Technologies (SACMAT)
ACM Transactions on Internet Technology (TOIT)
IEEE Transactions on Software Engineering (TSE)
Springer-Verlag Transactions on Computational Science (TCS)
IEEE Security and Privacy Magazine(S&P)
International Conference on Information Security and Assurance (ISA)
USENIX Security Symposium (USENIX Security)
International Conference on Information Systems Security (ICISS)
ACM Cloud Computing Security Workshop (CCSW)
Packt Publishing
Workshop on Virtual Machine Security (VMSec)
Wiley Software Practiec and Experience (SPE)

## COMPUTING SKILLS

**Programming Languages** - C, C++, Java, Python, Perl, PHP, JavaScript

**Operating Systems** - Linux, IBM AIX, MS Windows, Sun Solaris, Mac

**Other Applications** - Matlab, Maxima, Maple, Mathematica

## PUBLICATIONS


[1] Adam Bates, Kevin Butler, Alin Dobra, Brad Reaves, Patrick Cable, Thomas Moyer, and Nabil Schear. Retrofitting Applications with Provenance-Based Security Monitoring. `https://arxiv.org/abs/1609.00266`, September 2016.

[2] Adam Bates, Kevin R.B. Butler, and Thomas Moyer. Take only what you need: Leveraging mandatory access control policy to reduce provenance storage costs. In *7th USENIX Workshop on the Theory and Practice of Provenance (TaPP 15)*, Edinburgh, Scotland, July 2015. USENIX Association.

[3] Adam Bates, Dave Tian, Kevin R.B. Butler, and Thomas Moyer. Trustworthy whole-system provenance for the linux kernel. In *24th USENIX Security Symposium (USENIX Security 15)*, Washington, D.C., August 2015. USENIX Association.

[4] Uri Blumenthal, Nancy Crabtree, Thomas Moyer, and William Streilein. Mission-oriented Cyber Assessment and Recommendations Technique. *Journal of Sensitive Cyber Research and Engineering (JSCoRE)*, December 2014.

[5] Kevin Butler, Stephen McLaughlin, Thomas Moyer, Trent Jaeger, and Patrick McDaniel. SwitchBlade: Policy-Driven Disk Segmentation. Technical Report NAS-TR-0098-2008, Network and Security Research Center, Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA, November 2008.

[6] Kevin Butler, Stephen McLaughlin, Thomas Moyer, and Patrick McDaniel. New security architectures based on emerging disk functionality. *IEEE Security & Privacy Magazine*, September 2010.

[7] 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, Network and Security Research Center, Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA, April 2009.

[8] William Enck, Thomas Moyer, Patrick McDaniel, Subhabrata Sen, Panagiotis Sebos, Sylke Spoerel, Albert Greenberg, Yu-Wei Eric Sung, Sanjay Rao, and William Aiello. Configuration management at massive scale: System design and experience. *IEEE Journal on Selected Areas in Communications (JSAC)*, April 2009.

[9] Boniface Hicks, Sandra Rueda, Dave King, Thomas Moyer, Joshua Schiffman, Yogesh Sreenivasan, Patrick McDaniel, and Trent Jaeger. An Architecture for Enforcing End-to-End Access Control Over Web Applications. In *Proceedings of the 2010 Symposium on Access Control Models and Technologies, SACMAT '10*, June 2010.

[10] T. Moyer, K. Butler, J. Schiffman, P. McDaniel, and T. Jaeger. Scalable web content attestation. *IEEE Transactions on Computers*, 61(5):686–699, May 2012.

[11] Thomas Moyer. USENIX Conference on Web Application Developement Session Summaries. ;login: The USENIX Magazine, October 2010.

[12] Thomas Moyer. USENIX Security Symposium Session Summaries. ;login: The USENIX Magazine, August 2010.

[13] Thomas Moyer, Kevin Butler, Joshua Schiffman, Patrick McDaniel, and Trent Jaeger. Scalable Asynchronous Web Content Attestation. Technical Report NAS-TR-0095-2008, Network and Security Research Center, Department of Computer Science and Engineering, Pennslyvania State University, University Park, PA, USA, September 2008.

[14] Thomas Moyer, Kevin Butler, Joshua Schiffman, Patrick McDaniel, and Trent Jaeger. Scalable Web Content Attestation. In *ACSAC '09: Proceedings of the 2009 Annual Computer Security Applications Conference*, December 2009. acceptance rate=19.0%.

[15] Thomas Moyer, Kevin Butler, Joshua Schiffman, Patrick McDaniel, and Trent Jaeger. Scalable web content attestation. *IEEE Transactions on Computers*, March 2011.

[16] Thomas Moyer, Patric T. Cable, Karishma Chadha, Robert Cunningham, Nabil Schear, Warren Smith, Adam Bates, Kevin Butler, Frank Capobianco, and Trent Jaeger. Leveraging Data Provenance to Enhance Cyber Resilience. In *1st IEEE Cybersecurity Development (SecDev)*, November 2016.

[17] Thomas Moyer, Ann Davis, John Mitchell, and Jeffrey Wysocarski. Security Architecture for Net-centric Radios. *Journal of Sensitive Cyber Research and Engineering (JSCoRE)*, December 2014.

[18] Thomas Moyer and Vijay Gadepally. High-throughput Ingest of Data Provenance Records into Accumulo. In *2016 IEEE High Performance Extreme Computing Conference, HPEC*, September 2016.

[19] Thomas Moyer, Trent Jaeger, and Patrick McDaniel. Scalable Integrity-Guaranteed AJAX. In *Proceedings of the 14th Asia-Pacific Web Conference (APWeb)*, Kunming, China, April 2012.

[20] Thomas Moyer and Patrick McDaniel. Scalable Integrity-Guaranteed AJAX. Technical Report NAS-TR-0149-2011, Network and Security Research Center, Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA, March 2011.

[21] Nabil Schear, Patric T. Cable II, Thomas Moyer, Bryan Richard, and Robert Rudd. Bootstrapping and Maintaining Trust in the Cloud. In *Proceedings of the 32nd Annual Computer Security Applications Conference*, ACSAC 2016, pages 1–10, New York, NY, USA, December 2016. ACM.

[22] Joshua Schiffman, Thomas Moyer, Trent Jaeger, and Patrick McDaniel. Network-based Root of Trust for Installation. *IEEE Security & Privacy Magazine*, Jan 2011.

[23] Joshua Schiffman, Thomas Moyer, Christopher Shal, Trent Jaeger, and Patrick McDaniel. Justifying Integrity Using a Virtual Machine Verifier. In *Proceedings of the 2009 Annual Computer Security Applications Conference, ACSAC '09*, December 2009. acceptance rate=19.0%.

[24] Joshua Schiffman, Thomas Moyer, Christopher Shal, Trent Jaeger, and Patrick McDaniel. No Node Is an Island: Shamon Integrity Monitoring Approach. Technical Report NAS-TR-0103-2009, Network and Security Research Center, Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA, February 2009.

[25] Joshua Schiffman, Thomas Moyer, Hayawardh Vijayakumar, Trent Jaeger, and Patrick McDaniel. Seeding Clouds with Trust Anchors. Technical Report NAS-TR-0127-2010, Network and Security Research Center, Department of Computer Science and Engineering, Pennsylvania State University, University Park, PA, USA, April 2010.

[26] Joshua Schiffman, Thomas Moyer, Hayawardh Vijayakumar, Trent Jaeger, and Patrick McDaniel. Seeding Clouds with Trust Anchors. In *CCSW '10: Proceedings of the 2010 ACM workshop on Cloud computing security*. ACM, October 2010.