

Crispin Cowan, Ph.D

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| Work Address: | Home Address: |
| Immunix, Inc. | 3340 N.E. Hancock |
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Interests Host system security, operating systems, distributed systems, and programming languages.

Education Ph.D. in Computer Science, 1995, University of Western Ontario.
Thesis: "A Programming Model for Optimism"

Masters of Mathematics, Computer Science, 1990, University of Waterloo.
Bachelors of Mathematics, Co-op Honours, Computer Science, 1988, University of Waterloo.

Positions 98/01 - Present. Immunix, Inc., CTO, co-founder.
<http://immunix.com>

96/04 - Present. Oregon Graduate Institute. Department of Computer Science and Engineering. Research Assistant professor

94/12 - 96/04. Oregon Graduate Institute. Department of Computer Science and Engineering. Postdoctoral Research Associate.

92/05 - 92/08, 91/05 - 91/08. IBM T.J. Watson Research Lab. Research Intern, supervised by Dr. Josh Auerbach and Dr. Robert Strom.

Significant Achievements Founded Immunix: transitioned university research into a successful security company of strategic interest of major technology enterprises like Novell.

Pioneered compiled-in application intrusion prevention with StackGuard, and subsequently with FormatGuard and PointGuard.

Pioneered Linux kernel support for application security by leading the revolutionary Linux feature LSM (Linux Security Modules) feature in Linux 2.6:

- Built consortium of players to agree to and implement LSM, including IBM, SGI, the NSA, and McAfee.
- Achieved inclusion as a standard part of Linux 2.6.

Track record of consistent innovation in the security area: a stream of inventions over the last 10 years:

- 3 patents
- 42 peer reviewed papers
- moved research paper results to innovative products such as StackGuard, FormatGuard, and AppArmor

Skills Technology transfer: can effectively move innovative research results from concept, through prototype, to shipping products

Skills

Significant public speaking ability: have presented technical papers at major conferences such as SANS, USENIX, ACM, and IEEE conferences, with audiences up to 800.

Substantial experience facing customers:

- presenting complex technical products to both technical and non-technical customers, all levels of the customer's organization
- dynamic construction of use cases to show customers how existing technologies can solve their problems
- providing technical gravitas to senior customer prospects to close deals

Open source: deep knowledge of many open source licenses and their strategic and tactical implications.

Deep, broad network of personal contacts throughout the security industry and the open source community.

Recruiting: can easily recruit very high quality Linux and security engineers. Use of my name in a recruiting pitch enhances applicant response.

Technology strategy: can quickly analyze competing technologies.

Sponsored Research

Total contract history: \$2.1M

Crispin Cowan. Relative Vulnerability. DARPA contract, \$106K, August 2002 - July 2003.

Crispin Cowan. SWA: Secure Webmail Appliance. DARPA contract, \$220K, September 2002 - September 2003.

Crispin Cowan. Sardonix: Criticality for Critical Systems. DARPA contract, \$455K, July 2001 - June 2003.

Crispin Cowan, David Maier, and Lois Delcambre. Autonomix: Component, Network, and System Autonomy. DARPA contract, \$1.2M, June 1999 - June 2003.

Crispin Cowan. Principles and Practices of System Security. Grant from the State of Oregon to develop new curriculum in computer security, June 1998. \$25K
<http://www.cse.ogi.edu/~crispin/527/>

InDependence: Inferring Dependencies for System Components. Grant from USENIX to develop more automated techniques for configuring system software, October 1998.
<http://www.cse.ogi.edu/DISC/projects/independence/>

Patents

3 patents pending

Crispin Cowan, et al. Method and System for Parsimonious Application Security. Provisional patent filed February 2005.

Crispin Cowan, et al. PointGuard: Method and System for Protecting Programs Against Pointer Corruption. Patent pending 2002.

Adam Shostack, Crispin Cowan, Steve Beattie, and Seth Arnold. A Method for Computing the Optimal Time to Apply Security Patches. Patent pending 2002.

Professional Activities

Consistently on peer review panels for major security conferences and journals

Professional Activities

PGP Corporation: Technical Advisory Board

USENIX Freenix Program Committee 2005:

<http://www.usenix.org/events/usenix05/organizers.html>

USENIX Freenix Program Committee 2004:

<http://www.usenix.org/events/usenix04/organizers.html>

IEEE Conference on Dependable Systems and Networks 2004, program committee member <http://2004.dsn.org/>

ACM Computing and Communications Security 2003, program committee member for the special track on Industry Experience

<http://www.acm.org/sigsac/ccs/CCS2003/industryconf.html>

ACM Computing and Communications Security 2003, program committee member for the Workshop on Survivable and Self-Regenerative Systems

<http://ist.psu.edu/s2/ACM-SRS.html>

USENIX Security 2003 program committee member

<http://www.usenix.org/events/sec03/>

DISCEX 2003 program committee member

<http://www.iaands.org/discecx3/index.html>

Editorial Board, SANS Newsbites Weekly Security Digest, 2000 - 2002.

<http://www.sans.org/newlook/digests/newsbites.htm>

New Security Paradigms Workshop 1999 - 2001: publicity chair. <http://nspw.org>

USENIX Security 1999: program committee member

<http://www.usenix.org/publications/library/proceedings/sec99/>

International Workshop on Object Orientation in Operating Systems (IWOOS'96): local arrangements co-chair

Publications

42 peer reviewed scholarly publications

1. Crispin Cowan. Comprehensive Application-based Intrusion Detection and Rejection. DARPA contract to transfer Immunix technologies to industry and study their effectiveness. \$99K
2. Crispin Cowan. Principles and Practices of System Security. Grant from the State of Oregon to develop new curriculum in computer security, June 1998. \$25K
<http://www.cse.ogi.edu/~crispin/527/>
3. InDependence: Inferring Dependencies for System Components. Grant from USENIX to develop more automated techniques for configuring system software, October 1998.
<http://www.cse.ogi.edu/DISC/projects/independence/>
4. Calton Pu, Andrew Black, Charles Consel, and Jonathan Walpole, Crispin Cowan as technical lead. Immunix: Adaptive System Survivability. Grant from DARPA to study enhancing host system survivability against security attack, August 1996.
<http://immunix.org>
5. Crispin Cowan. Survivability: Synergizing Security and Reliability. Chapter in "Advances in Computers", 2004, edited by Marvin Zelkowitz, published by Academic Press.

6. Crispin Cowan, Steve Beattie, John Johansen and Perry Wagle. PointGuard™: Protecting Pointers From Buffer Overflow Vulnerabilities. 12th USENIX Security Symposium, Washington, DC, August 2003.
7. Crispin Cowan. Software Security for Open Source Systems. IEEE Security & Privacy Magazine, February 2003, Volume 1, Number 1, pages 35-48.
8. Crispin Cowan, Seth Arnold, Steve Beattie, Chris Wright, and John Viega. Defcon Capture the Flag: Defending Vulnerable Code from Intense Attack. DARPA DISCEX III Conference, Washington DC, April 22-24 2003.
9. Steve Beattie, Seth ARnold, Crispin Cowan, Perry Wagle, Chris Wright, and Adam Shostack. Timing the Application of Security Patches for Optimal Uptime. USENIX 16th Systems Administration Conference (LISA 2002), Philadelphia, PA, December 2002.
10. Chris Wright, Crispin Cowan, Stephen Smalley, James Morris, and Greg Kroah-Hartman. Linux Security Modules: General Security Support for the Linux Kernel. 11th USENIX Security Symposium, San Francisco, CA, August 2002.
11. Chris Wright, Crispin Cowan, Stephen Smalley, James Morris, and Greg Kroah-Hartman. Linux Security Module Framework. 2002 Ottawa Linux Symposium, Ottawa, Canada, June 2002.
12. Crispin Cowan, Steve Beattie, Chris Wright, and Greg Kroah-Hartman,. RaceGuard: Kernel Protection From Temporary File Race Vulnerabilities. 10th USENIX Security Symposium, Washington DC, August 2001.
13. Crispin Cowan, Matt Barringer, Steve Beattie, Greg Kroah-Hartman, Mike Frantzen, and Jamie Lokier. FormatGuard: Automatic Protection From printf Format String Vulnerabilities. 10th USENIX Security Symposium, Washington DC, August 2001.
14. Crispin Cowan, Steve Beattie, Greg Kroah-Hartman, Calton Pu, Perry Wagle, and Virgil Gligor. SubDomain: Parsimonious Server Security. USENIX 14th Systems Administration Conference (LISA 2000), New Orleans LA, December 2000.
15. Crispin Cowan, Perry Wagle, Calton Pu, Steve Beattie, and Jonathan Walpole. Buffer Overflows: Attacks and Defenses for the Vulnerability of the Decade. DARPA Information Survivability Conference and Expo (DISCEX), Hilton Head Island SC, January 2000. Also presented as an invited talk at SANS 2000, Orlando FL, March 2000.
16. Heather Hinton, Crispin Cowan, Lois Delcambre, and Shawn Bowers. SAM: Security Adaptation Manager. 1999 Annual Computer Security Applications Conference (ACSAC), Phoenix, AZ, December 1999.
17. Crispin Cowan, Steve Beattie, Ryan Finnin Day, Calton Pu, Perry Wagle, and Eric Walthinsen. Protecting Systems from Stack Smashing Attacks with StackGuard. 1999 Linux Expo, Raleigh, NC, May 1999.
18. Crispin Cowan and Calton Pu. Survivability From a Sow's Ear: The Retrofit Security Requirement. 2nd Information Survivability Workshop, Orlando, FL, October 1998.

19. Crispin Cowan, Calton Pu, and Heather Hinton. Death, Taxes, and Imperfect Software: Surviving the Inevitable. New Security Paradigms Workshop, Charlotte, VA, September 1998.
20. Crispin Cowan, Calton Pu, Dave Maier, Heather Hinton, Peat Bakke, Steve Beattie, Aaron Grier, Perry Wagle, and Qian Zhang. StackGuard: Automatic Adaptive Detection and Prevention of Buffer-Overflow Attacks. *7th USENIX Security Conference*, San Antonio, TX, January 1998.
21. Eugen N. Volanschi and Charles Consel and Gilles Muller and Crispin Cowan. Declarative Specialization of Object-Oriented Programs. *Proceedings of the conference on Object-Oriented Programming Systems, Languages, and Applications (OOPSLA'97)*, Atlanta, GA, October 1997.
22. Jonathan Walpole, Rainer Koster, Shanwei Cen, Crispin Cowan, David Maier, Dylan McNamee, Calton Pu, David Steere, and Liujin Yu. A Player for Adaptive MPEG Video Streaming Over the Internet. *Proceedings of the 26th Applied Imagery Pattern Recognition Workshop, AIPR-97, SPIE,*, Washington DC, October 1997.
23. Dan Revel, Crispin Cowan, Dylan McNamee, Calton Pu, and Jonathan Walpole. Predictable File Access Latency for Multimedia. *Proceedings of the 5th International Workshop on Quality of Service (IWQoS'97)*, New York, NY, May 1997.
24. Crispin Cowan and Calton Pu. Immunix: Survivability Through Specialization. *Proceedings of the 1997 Information Survivability Workshop*, San Diego, CA, February 1997.
25. Calton Pu, Andrew Black, Crispin Cowan, and Jonathan Walpole. Microlanguages for Operating System Specialization. *SIGPLAN Workshop on Domain-Specific Languages*, Paris, France, January 1997.
26. Calton Pu, Andrew Black, Crispin Cowan, and Jonathan Walpole. A Specialization Toolkit to Increase the Diversity of Operating Systems. *Proceedings of the 1996 IC-MAS Workshop on Immunity-Based Systems*, Nara, Japan, December 1996.
27. Dan Revel, Crispin Cowan, Dylan McNamee, Calton Pu, and Jonathan Walpole. An Architecture for Flexible Multimedia Prefetching. *Workshop on Resource Allocation Problems in Multimedia Systems*, Washington DC, December 1996.
28. Veronica Baiceanu, Crispin Cowan, Dylan McNamee, Calton Pu, and Jonathan Walpole. Multimedia Applications Require Adaptive CPU Scheduling. *Workshop on Resource Allocation Problems in Multimedia Systems*, Washington DC, December 1996.
29. Crispin Cowan, Andrew Black, Charles Krasic, Calton Pu, Jonathan Walpole, Charles Consel, and Eugen-Nicolae Volanschi. Specialization Classes: An Object Framework for Specialization. *Proceedings of the Fifth International Workshop on Object-Orientation in Operating Systems (IWOOS'96)*, Seattle, WA, October 1996.
30. Heiko Thimm, Wolfgang Klas, Jonathan Walpole, Calton Pu, and Crispin Cowan. Managing Adaptive Presentation Executions in Distributed Multimedia Database systems. *International Workshop on Multimedia Database Management Systems (IWM-MDBMS'96)*, August 1996.

31. Crispin Cowan, Tito Autrey, Charles Krasic, Calton Pu, and Jonathan Walpole. Fast Concurrent Dynamic Linking for an Adaptive Operating System. *International conference on Configurable Distributed systems (ICCDs'96)*, Annapolis, MD, May 1996
32. Crispin Cowan and Hanan Lutfiyya. A Wait-Free Algorithm for Optimistic Programming: HOPE Realized. *16th International Conference on Distributed Computing Systems (ICDCS'96)*, Hong Kong, May 1996.
33. Crispin Cowan and Hanan Lutfiyya. Formal Semantics for Expressing Optimism: The Meaning of HOPE. *1995 Symposium on the Principles of Distributed Computing (PODC)*, Ottawa, Ontario, August 1995.
34. Calton Pu, Tito Autrey, Andrew Black, Charles Consel, Crispin Cowan, Jon Inouye, Lakshmi Kethana, Jonathan Walpole, and Ke Zhang. Optimistic Incremental Specialization: Streamlining a Commercial Operating System. *Symposium on Operating Systems (SOSP)*, Copper Mountain, CO, December 1995.
35. Crispin Cowan, Shanwei Cen, Jonathan Walpole, and Calton Pu. Adaptive Methods for Distributed Video Presentation. *ACM Computing Surveys special symposium on Multimedia*, December 1995.
36. Shanwei Cen, Calton Pu, Richard Staehli, Crispin Cowan, and Jonathan Walpole. Demonstrating the Effects of a Distributed Real-Time MPEG Video Audio Player. Demonstrated at the *1995 ACM Multimedia Conference*, San Francisco, CA, November 1995.
37. Crispin Cowan, Hanan Lutfiyya, and Mike Bauer. Performance Benefits of Optimistic Programming: A Measure of HOPE. *Fourth IEEE International Symposium on High-Performance Distributed Computing (HPDC-4)*, Arlington, VA, August 1995.
38. Shanwei Cen, Calton Pu, Richard Staehli, Crispin Cowan, and Jonathan Walpole. A Distributed Real-Time MPEG Video Audio Player. *Proceedings of the 1995 International Workshop on Network and Operating System Support for Digital Audio and Video (NOSSDAV'95)*, New Hampshire, April 1995.
39. Hanan Lutfiyya and Crispin Cowan. Optimistic Language Constructs. *ICSE-17 Workshop on Research Issues in the Intersection of Software Engineering and Programming Languages*, Seattle, WA, April 1995.
40. Crispin Cowan. Optimistic Programming in PVM. *Proceedings of the 2nd PVM User's Group Meeting*, Oak Ridge, TN, May 1994.
41. Crispin Cowan, Hanan Lutfiyya, and Mike Bauer. Increasing Concurrency Through Optimism: A Reason for HOPE. *Proceedings of the 1994 ACM Computer Science Conference*, Phoenix, AZ, March 1994.
42. Forbes Burkowski and Charles L.A. Clarke and Crispin Cowan and Gordon Vreugdenhil. Architectural Support for Lightweight Tasking in the Sylvan Multiprocessor System. *Symposium on Experience with Distributed and Multiprocessor Systems (SEDMS II)*, Atlanta, GA, March 1991.