

# Diego Zamboni

COMPUTER SCIENTIST · RESEARCH AND ENGINEERING LEADER · ENTERPRISE ARCHITECT

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## Key skills

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**Leadership** 29 years of multidisciplinary team and project leadership experience; systems architecture; [Scaled Agile Framework](#) (SAFe) Architect and Product Owner.

**Communications** Excellent written and spoken communication skills, extensive teaching experience.

**Research** Ph.D. in Computer Science, 9 years of experience at IBM Research.

**Computer Security** Enterprise security architecture; risk management; compliance; intrusion detection and prevention; operating systems and network security; software security and secure software development; virtualization and cloud computing security; CISSP certification.

**Systems and Development** Unix/Linux systems engineering and administration, system health management and monitoring, cloud platforms, software development, configuration management.

**Attitude** I am passionate about and always willing to support science, technology and education.

## Professional highlights

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- 18 years of experience in education and research, 11 years of industry experience.
- Management and leadership
  - Manage security architecture, risk management, data governance and compliance (ISO27001, FINMA, ISAE3402/3000, etc.) for Swisscom's IT Clouds platforms.
  - Established and lead the Swisscom IT Clouds security community of practice.
  - Established and led the *Health and State Management* team at Swisscom to design, implement and operate a framework for scalable monitoring, logging and alerting.
  - Established and led the first computer security organization at UNAM, which has grown into the university's [Information Security Coordination \(UNAM-CERT\)](#).
  - Managed IT security customer relationships at HP Enterprise Services, including overseeing the activities of operational and engineering teams, risk and compliance management, requirements discussion and reporting.
  - Managed the CFEngine language product roadmap.
- Research, architecture and design
  - Designed the *Orchard* monitoring framework for Swisscom's *Application Cloud* platform, and led the team that implemented it and brought it into production.
  - Designed and implemented the *Billy Goat* malware capture and analysis system at IBM.
- Communications and community
  - Author of multiple books including [Learning CFEngine](#), [Learning Hammerspoon](#) and [Literate Configuration](#).
  - [Program chair and program committee member for multiple conferences](#) including the RAID symposium, DIMVA conference, the *Computer Security Day* and *Computer Security* conference at UNAM, and others.
  - Member of the Editorial Board of the *Computers & Security* Journal.

# Experience

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## Swisscom

ENTERPRISE ARCHITECT AND IT CLOUDS SOLUTION SECURITY ARCHITECT

2015 – Present

Switzerland

Apr 2019 – Present

- As an *Enterprise Architect*, I participate in the design of future products and solutions offered by Swisscom, in collaboration with architects from all other divisions of the company.
- As *Solution Security Architect* for [Swisscom's Cloud Platforms](#) —which include *Enterprise Service Cloud*, *Enterprise Application Cloud*, *Dynamic Computing Services*, *Enterprise Cloud for SAP Applications* and related services— I am responsible for the security and compliance of those services. I define, prioritize and drive relevant product features and business goals. I also lead the IT Clouds Security Community of Practice and advise engineering teams on compliance, governance and operational activities.
- Selected achievements and activities:
  - Ensure cloud platform and service compliance with internal, contractual and regulatory standards, including ISO27001, ISAE3402/3000, FINMA and GDPR.
  - Establish and currently lead a community of around 30 *Security Champions* from different teams, who drive security initiatives and promote the security culture within the Swisscom IT Clouds organization.
  - Coordinate threat modelings, audits, penetration tests and security compliance reporting.
  - Coordinate organization- and team-wide processes for risk and vulnerability management.
  - Development of the Swisscom *Platforms* vision for 2025.

TEAM LEAD & PRODUCT OWNER FOR HEALTH & STATE MANAGEMENT

Mar 2016 – Apr 2019

- I built and led a team which evolved on par with Swisscom cloud platforms to provide their monitoring and logging capabilities. My responsibilities included people management (up to 16 people), definition and prioritization of requirements and roadmaps (in collaboration with Product Managers and other stakeholders), technical architecture, and managing the planning and execution of team activities.
- Selected achievements:
  - Led the transition of the *Enterprise Cloud* LEMM (Logging, Event Management and Monitoring) and Access & Inventory frameworks into maintenance mode as the platform was retired.
  - Defined the scope and mission of the Health and State Management (HSM) team as part of the new [Enterprise Service Cloud](#) project, and later of other platforms as the *IT Clouds* scope expanded to [Application Cloud](#), [Enterprise Cloud for SAP Solutions](#) and [Dynamic Computing Services](#).
  - Defined the logging and monitoring architecture for the *Enterprise Service Cloud* platform based on VMware vRealize Operations and vRealize Log Insight.
  - Led the transition of the *Application Cloud* platform monitoring from the Orchard framework to a TICK-based framework.
  - Defined architecture and oversaw implementation of the Customer Log Forwarding service.
  - Managed business relationship and technical implementation of OpsGenie for alert management in IT Clouds.
- Main technologies involved: VMware vSphere (ESX, vCenter, NSX), VMware vRealize Operations Manager and Log Insight, Ansible (configuration management), OpsGenie (alert management).

CLOUD ARCHITECT AND ORCHARD PROJECT LEAD

Aug 2015 – Mar 2016

- Managed a team of three people and led the *Orchard* project through its implementation, production release and further improvements and development.

## Swisscom Cloud Lab

2014 – 2015

U.S.A. (remote)

SENIOR PLATFORM ARCHITECT

Aug 2014 – Jul 2015

- Designed the architecture and implemented the initial prototype for the *Orchard* health-management and self-healing framework for Swisscom's *Application Cloud* Platform-as-a-Service service.
- Main technologies involved: OpenStack (cloud computing infrastructure), Cloud Foundry (application platform), Consul (health management and service discovery), RabbitMQ (message bus), Riemann (event analysis).

## CFEngine AS

2011 – 2014 Norway/U.S.A. (remote)

PRODUCT MANAGER

Aug 2013 – Jun 2014

- Managed the CFEngine language roadmap.
- Coordinated the [CFEngine Design Center](#) project.
- Coordinated the work on CFEngine third-party integration (e.g. AWS EC2, VMware, Docker and OpenStack).
- Developed code for both the Design Center and some of the integrations.

- CFEngine Advocate, with a special focus on security.
- Wrote the book [Learning CFEngine 3](#), published by O'Reilly Media, which became the de facto introductory text to CFEngine.
- Gave talks, wrote articles and blog posts, taught classes, and in general spread the word about CFEngine.
- Developed and implemented the strategy for CFEngine as a security component.

**HP Enterprise Services**

2009 – 2011

Mexico

## ACCOUNT SECURITY OFFICER

Oct 2010 – Oct 2011

- Acted as first point of contact for all security-related issues for five HP enterprise customers in Mexico.
- Initiated, advised and managed security-related projects.
- Handled communication and coordination between technical teams involved in security initiatives.
- Involved in all security-related decisions at the sales, design, implementation, delivery and ongoing maintenance stages of IT Outsourcing projects.

## IT OUTSOURCING SERVICE DELIVERY CONSULTANT

Nov 2009 – Oct 2010

- Helped multidisciplinary customer teams (software engineering, IT management, networking, sales and support) by solving complex problems in customer environments.
- Performed analysis, design and implementation of solutions in multiple areas of expertise, including system automation, configuration management, system administration, system design, virtualization, performance and security.

**IBM Zurich Research Lab**

2001 – 2009

Switzerland

## RESEARCH STAFF MEMBER

Oct 2001 – Oct 2009

- I was a member of the [Global Security Analysis Laboratory](#) (GSAL), where I worked in intrusion detection, malware detection and containment, and virtualization security research projects.
- See [Research](#) for details of my research.

**Sun Microsystems**

1997

U.S.A.

## DEVELOPER (INTERN)

May 1997 – Aug 1997

- Developer for the *Bruce* host vulnerability scanner, later released as the [Sun Enterprise Network Security Service](#) (SENSS).
- Designed and implemented the first version of the network-based components of *Bruce*, which allowed it to operate on several hosts in a network, controlled from a central location.

**National Autonomous University of Mexico (UNAM)**

1991 – 1996

Mexico

## HEAD OF COMPUTER SECURITY AREA

Aug 1995 – Aug 1996

- Founded UNAM's *Computer Security Area*, the University's first team dedicated to computer security, which has evolved into the [Information Security Coordination \(UNAM-CERT\)](#).
- Managed up to nine people working on different projects related to computer security.
- Managed security monitoring for a Cray supercomputer and 22 Unix workstations.
- Provided security services to the whole University, including incident response, security information, auditing and teaching.
- Established the celebration of the *International Computer Security Day* (sponsored by the Association for Computing Machinery) at UNAM. Acted as the main organizer of the event for two years (1994 and 1995). This event has grown and evolved into the [Computer Security Day](#) and the [Computer Security Congress](#).
- Designed and headed development of an audit-analysis tool for Unix systems (SAINT) [24].

## SYSTEM ADMINISTRATOR

Nov 1991 – Aug 1995

- System administrator at UNAM's Supercomputing Center, managing a [Cray Y-MP Supercomputer](#) and related systems.
- Managed the Network Queueing Subsystem (NQS),
- Managed and provided support for 22 Unix workstations.
- Monitored the security of the Cray supercomputer and related workstations.
- Other responsibilities: user administration, operating system installation, resource management, security policies.

**Education****Ph.D. in Computer Science**

West Lafayette, IN, U.S.A.

## PURDUE UNIVERSITY

Aug 1996 – Aug 2001

- Thesis title: [Using Internal Sensors for Computer Intrusion Detection](#).
- Advisor: [Eugene H. Spafford](#).

## M.S. in Computer Science

PURDUE UNIVERSITY

- Advisor: [Eugene H. Spafford](#).

West Lafayette, IN, U.S.A.

Aug 1996 – May 1998

## Bachelor's degree in Computer Engineering

NATIONAL AUTONOMOUS UNIVERSITY OF MEXICO (UNAM)

Mexico City, Mexico

Aug 1989 – Jul 1995

- Thesis title: [UNAM/Cray Project for Security in the Unix Operating System](#) (in Spanish, original title: *Proyecto UNAM/Cray de Seguridad en el Sistema Operativo Unix*).

## Certifications

### Certified Information Systems Security Professional (CISSP)

April 2019

(ISC)<sup>2</sup>, THE INTERNATIONAL INFORMATION SYSTEM SECURITY CERTIFICATION CONSORTIUM



The vendor-neutral CISSP credential confirms technical knowledge and experience to design, engineer, implement, and manage the overall security posture of an organization. Required by the world's most security-conscious organizations, CISSP is the gold-standard information security certification that assures information security leaders possess the breadth and depth of knowledge to establish holistic security programs that protect against threats in an increasingly complex cyber world.

### SAFe® 4 Certified Product Owner/Product Manager

July 2017 (not renewed)

SCALED AGILE INC.



A SAFe® 4 Certified Product Owner/Product Manager is a SAFe professional who works with customers and development organizations to identify and write requirements. Key areas of competency include identifying customer needs, writing epics, capabilities, features, stories, and prioritizing work in order to effectively deliver value to the enterprise.

## Research

(see "[Publications](#)" for publication reference details)

### Selected research projects at IBM

PHANTOM

2008 – 2009

- Security for VMware virtual environments using virtual machine introspection (based on the [VMware VMsafe API](#)) to provide intrusion detection and prevention capabilities.
- Publications: [13].

BILLY GOAT: ACTIVE WORM DETECTION AND CAPTURE

2002 – 2008

- Billy Goat was the first instance of what is today called *honeypots* and *honeynets*.
  - An active worm-detection system, widely deployed (at the time) in the IBM worldwide internal network. It listens for connections to unused IP address ranges and actively responds to those connections to accurately detect worm-infected machines, and in many cases capture the worms themselves. Billy Goat is engineered for distributed deployment, with each device containing standalone detection and reporting capabilities, together with data centralization features that allow network-wide data analysis and reporting.
- Publications: [18, 25]

ROUTER-BASED BILLY GOAT

2005 – 2007

- An active worm-capture device deployed at the network boundary and coupled with the border router, that allows the Billy Goat to effectively and automatically spoof every unused IP address outside the local network. This makes it possible for the Router-based Billy Goat to accurately detect local infected machines and prevent them from establishing connections to the outside, limiting the propagation of the worms to the outside network.
- Publications: [16]

SOC IN A Box

2005 – 2007

- Integrated device containing multiple security tools: intrusion detection, worm detection, vulnerability scanning and network discovery. Precursor to what is today called *Unified Threat Management* systems.

- Host-based, behavior-based intrusion detection using sequences of system calls.

## Ph.D. Thesis Research

### USING INTERNAL SENSORS AND EMBEDDED DETECTORS FOR INTRUSION DETECTION

- Study of data collection methods for intrusion detection systems.
- Implementation of novel methods for data collection in intrusion detection systems.
- Analysis of the properties, advantages and disadvantages of internal sensors and embedded detectors as data collection and analysis elements in intrusion detection systems.
- Publications: [11, 19, 20, 27, 32]

## Additional research projects

### USING AUTONOMOUS AGENTS FOR INTRUSION DETECTION

- Design and documentation of an architecture (AAFID) to perform distributed monitoring and intrusion detection using autonomous agents.
- Implementation of a prototype according to the architecture. This prototype is [published as open source](#).
- Exploration of research issues in the distributed intrusion detection area.
- Publications: [21, 22, 28, 35, 33, 34].

### ANALYSIS OF A DENIAL-OF-SERVICE ATTACK ON TCP/IP (SYNKill)

- Collaborated in the analysis of the SYN-flooding denial-of-service attack against TCP and in the implementation of a defense tool.
- Publications: [23], awarded the [2020 IEEE Security & Privacy Test of Time Award](#).

## System Development and Management

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**Programming languages** Ruby, Python, C, Perl, Java, Clojure, Racket, AWK, Unix shells, LISP.

**Development environments** Unix/Linux, Cloud Foundry, Amazon EC2, macOS.

**Unix system administration** Linux (multiple distributions), OpenBSD, FreeBSD, macOS, Solaris.

**Configuration management** CFEngine, Puppet, Chef, Ansible.

**Virtualization, containers and cloud** VMWare (ESX, vSphere), OpenStack, Amazon EC2, Docker, Cloud Foundry.

**Health Management and Monitoring** VMware vRealize Operations Manager, vRealize Log Insight, Nagios, Icinga.

**Other technologies** REST APIs, Riemann (event stream processing), XML and related technologies, network programming, database programming (SQL), kernel programming (OpenBSD and Linux), HTML.

## Software Development Projects

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Publicly available software projects: see <https://gitlab.com/zzamboni> and <https://github.com/zzamboni/>

### Other software projects (not publicly available)

PILATUS (IBM)

2005 – 2007

A system installer that allows arbitrary system installation and configurations, allowing for both proprietary and open source components to be installed in an automated fashion. Open source components can be downloaded directly from their original source to avoid distributing them.

SOC IN A Box (IBM)

2005 – 2007

A specialized Linux distribution containing multiple security services for integrated security monitoring in small and medium networks. Implementation includes also backend infrastructure components for system installation, configuration and upgrade; and data centralization, analysis and reporting.

BILLY GOAT (IBM)

2002 – 2007

A specialized Linux distribution containing multiple sensors for detection of large-scale automated attacks. Implementation includes also backend infrastructure components for system configuration and upgrade, data centralization, analysis and reporting.

A system of sensors for intrusion detection developed in OpenBSD through code instrumentation. Developed as part of my Ph.D. thesis work.

## Honors & Awards

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May 2020	<b>IEEE Security &amp; Privacy Test of Time Award</b> ( <a href="#">IEEE S&amp;P page</a> , <a href="#">CERIAS blog post</a> ), IEEE	U.S.A.
2010	<b>CFEngine Champion</b> , CFEngine AS	Norway
Jul 2001	<b>Josef Raviv Memorial Postdoctoral Fellowship</b> , IBM	U.S.A.
Apr 2001	<b>Member of Phi Beta Delta</b> , honor society recognizing scholarly achievement	U.S.A.
Sep 2000	<b>UPE Microsoft Scholarship Award</b> , honor society recognizing scholarly achievement	U.S.A.
Apr 1998	<b>Member of Upsilon Pi Epsilon</b> , the ACM Computer Sciences honor society	U.S.A.
May 1996	<b>Fulbright Scholarship</b> , for pursuing Ph.D. studies at Purdue University	Mexico

## Program Committees and Boards

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2011–2013	<b>Editorial Board Member</b> , Computers & Security Journal	
2007–2017	<b>Steering Committee Member</b> , Intl. Symposium on Recent Advances in Intrusion Detection	
2006	<b>Program Chair</b> , 9th Intl. Symposium on Recent Advances in Intrusion Detection (RAID)	Germany
2001–2005	<b>Program Committee Member</b> , Intl. Symposium on Recent Advances in Intrusion Detection	
2009	<b>Program Co-chair</b> , IBM Academy of Technology Security and Privacy Symposium	
2009	<b>Program Chair</b> , ZISC Workshop on Security in Virtualized Environments and Cloud Computing	Switzerland
2008	<b>Program Chair</b> , Detection of Intrusions and Malware & Vulnerability Assessment (DIMVA)	France
2007	<b>Program Committee Member</b> , IEEE Security and Privacy Symposium	U.S.A.
2003–2007	<b>Program Committee Member</b> , Annual Computer Security Applications Conference (ACSAC)	
1994–2000	<b>Program Committee Member</b> , Computer Security Day Conference	Mexico
1994–1995	<b>Founder and organizer</b> , Computer Security Day Conference	Mexico

## Teaching and Advising

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### Students

DANIELE SGANDURRA, UNIVERSITY OF PISA, ITALY	<i>Internship advisor</i>	2009
• Project: Design and implementation of process injection using virtual machine introspection.		
MARTIN CARBONE, GEORGIA INSTITUTE OF TECHNOLOGY, U.S.A.	<i>Internship advisor</i>	2007
Project: Implementation of a proof of concept Hyperjacking attack on Intel platform.		
URKO ZURUTUZA ORTEGA, MONDRAGON UNIVERSITY, SPAIN	<i>Ph.D. co-advisor</i>	2005 – 2008
• Thesis: <a href="#">Data Mining Approaches for Analysis of Worm Activity Towards Automatic Signature Generation</a>		
MILTON YATES, ENST BRETAGNE, FRANCE	<i>External Diploma Thesis advisor</i>	2005
• Thesis: <a href="#">The Router-based Billy Goat Project</a>		
CANDID WÜEST, ETH ZURICH, SWITZERLAND	<i>Diploma Thesis tutor</i>	2002 – 2003
• Thesis: <a href="#">Desktop Firewalls and Intrusion Detection</a>		

### Teaching

CISSP TRAINING (30 HOURS)	<i>iNetworks, Mexico (remote class)</i>	2020
CFENGINE ONE-DAY TRAINING CLASS (8 HOURS)	<i>Multiple venues</i>	2011 – 2013
“VIRTUALIZATION” LECTURE (2 HOURS), SYSTEMS SECURITY CLASS, COMPUTER SCIENCE DEPT.	<i>ETH Zürich</i>	2011 – 2013
“INTRUSION DETECTION: BASIC CONCEPTS AND CURRENT RESEARCH AT IBM” CLASS (3 HOURS), INFORMATION TECHNOLOGY SECURITY SPRING SCHOOL	<i>University of Lausanne</i>	2005

"INTRODUCTION TO COMPUTER SECURITY" CLASS (40 HOURS)	ITESM, Mexico	2003
EE495 ("INFORMATION EXTRACTION, RETRIEVAL AND SECURITY") COURSE	Purdue University, U.S.A.	2000
<ul style="list-style-type: none"> <li>• Co-designed eight security-related lectures and taught two of them.</li> <li>• Co-designed the class project.</li> </ul>		
"SSH: ACHIEVING SECURE COMMUNICATION OVER INSECURE CHANNELS" CLASS	CSI NetSec conference, U.S.A.	2000
"PROTECTING YOUR COMPUTING SYSTEM" CLASS	Schlumberger, U.S.A.	1997
SUPERCOMPUTING INTERNSHIP PROGRAM COURSES	UNAM, Mexico	1991 - 1996
<ul style="list-style-type: none"> <li>• Designed and taught multiple courses (10–40 hours long) on the following topics:           <ul style="list-style-type: none"> <li>- Introduction to Unix</li> <li>- Unix utilities</li> <li>- Unix security</li> <li>- Basic Unix administration</li> <li>- Advanced Unix administration</li> <li>- UNICOS system administration on Cray supercomputers</li> </ul> </li> </ul>		

## Other Professional Activities

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1998–	<a href="#">The Association for Computing Machinery (ACM)</a> , Member	
2000	<a href="#">Purdue.pm, the Purdue Perl Users Group</a> , Founder	U.S.A.
1999	<a href="#">Purdue University Chapter of Upsilon Pi Epsilon</a> , President	U.S.A.
1998	<a href="#">Purdue University Chapter of Upsilon Pi Epsilon</a> , Secretary	U.S.A.

## References

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Available by request.

## Publications, Talks and Intellectual Property

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### Books

- [1] Diego Zamboni. *Publishing with Emacs, Org-mode and Leanpub*. June 2020. URL: <https://leanpub.com/emacs-org-leanpub>.
- [2] Diego Zamboni. *Literate Configuration*. Nov. 2019. URL: <https://leanpub.com/lit-config>.
- [3] Diego Zamboni. *Utilerías de Unix (Unix utilities course notes)*. Aug. 2019. URL: <https://leanpub.com/utileras-unix>.
- [4] Diego Zamboni. *Learning Hammerspoon*. Self published, Oct. 2018. URL: <https://leanpub.com/learning-hammerspoon>.
- [5] Diego Zamboni. *Learning CFEngine*. O'Reilly Media, Inc. 2012–2017, afterwards self-published, 2017. ISBN: 9781449312206. URL: <http://cf-learn.info/>.

### Editorial Activities

- [6] *Computers & Security Journal*. Elsevier. Member of the Editorial Board. 2011–2013.
- [7] Deborah Frincke, Andreas Wespi, and Diego Zamboni, eds. *Computer Networks* 51.5 (Apr. 2007): *From Intrusion Detection to Self-Protection*. ISSN: 1389-1286. URL: <http://dx.doi.org/10.1016/j.comnet.2006.10.004>.
- [8] Diego Zamboni and Christopher Kruegel, eds. *Recent Advances in Intrusion Detection (RAID): 9th International Symposium (Hamburg, Germany, Sept. 20–22, 2006)*. Lecture Notes in Computer Science. Secaucus, NJ, USA: Springer-Verlag New York, Inc., 2006. ISBN: 354039723X.
- [9] Alfonso Valdes and Diego Zamboni, eds. *Recent Advances in Intrusion Detection (RAID): 8th International Symposium (Seattle, WA, U.S.A. Sept. 7–9, 2005)*. Lecture Notes in Computer Science. Secaucus, NJ, USA: Springer-Verlag New York, Inc., 2005. ISBN: 3540317783.
- [10] Diego Zamboni, ed. *Software: Practice and Experience* 33.5 (Apr. 2003): *Special issue on “Security Software”*. URL: <http://onlinelibrary.wiley.com/doi/10.1002/spe.v33:5/issuetoc>.

### Theses

- [11] Diego Zamboni. "Using Internal Sensors for Computer Intrusion Detection". CERIAS TR 2001-42. PhD thesis. West Lafayette, IN: Purdue University, Aug. 2001. URL: [https://www.cerias.purdue.edu/apps/reports\\_and\\_papers/view/1800](https://www.cerias.purdue.edu/apps/reports_and_papers/view/1800).
- [12] Diego Zamboni. "Proyecto UNAM/Cray de Seguridad en el Sistema Operativo Unix (UNAM/Cray project for Unix System Security)". Spanish. B.Sc. Thesis. Universidad Nacional Autonoma de México, June 1995. URL: <https://zzamboni.org/files/theses/zamboni-bachelors-thesis.pdf>.

## Refereed Papers

- [13] Mihai Christodorescu et al. "Cloud Security is Not (Just) Virtualization Security: A Short Paper". In: *Proceedings of the 2009 ACM Workshop on Cloud Computing Security*. Chicago, Illinois, USA: ACM, 2009, pp. 97–102. ISBN: 978-1-60558-784-4. DOI: [10.1145/1655008.1655022](https://doi.org/10.1145/1655008.1655022).
- [14] U. Zurutuza et al. "Un marco inteligente para el análisis de tráfico generado por gusanos en Internet (An intelligent framework for analysis of worm-generated Internet traffic)". Spanish. In: *Actas de la X Reunión Española sobre Criptología y Seguridad de la Información (X Spanish Meeting on Cryptology and Information Security)*. Sept. 2008.
- [15] Urko Zurutuza, Roberto Uribeetxeberria, and Diego Zamboni. "A data mining approach for analysis of worm activity through automatic signature generation". In: *Proceedings of the 1st ACM workshop on AISec (AISec'08)*. Alexandria, Virginia, USA: Association for Computing Machinery, Oct. 2008, pp. 61–70. ISBN: 978-1-60558-291-7. URL: <http://doi.acm.org/10.1145/1456377.1456394>.
- [16] Diego Zamboni, James Riordan, and Milton Yates. "Boundary detection and containment of local worm infections". In: *Proceedings of the 3rd Workshop on Steps to Reducing Unwanted Traffic on the Internet (SRUTI'07)*. Usenix. June 2007. URL: [http://www.usenix.org/events/sruti07/tech/full\\_papers/zamboni/zamboni.pdf](http://www.usenix.org/events/sruti07/tech/full_papers/zamboni/zamboni.pdf).
- [17] Urko Zurutuza, Roberto Uribeetxeberria, and Diego Zamboni. "Anàlisis de datos procedentes de un sistema de detección de gusanos mediante técnicas de clustering (Analysis of data from a worm-detection system using clustering techniques)". In: *Actas del II Simposio sobre Seguridad Informática (SSI'2007), II Congreso Español de Informática (CEDI 2007) (Proceedings of the II Symposium on Computer Security, II Spanish Conference on Informatics)*. Sept. 2007, pp. 87–94.
- [18] James Riordan, Diego Zamboni, and Yann Duponchel. "Building and deploying Billy Goat, a worm-detection system". In: *Proceedings of the 18th Annual FIRST Conference*. June 2006.
- [19] Florian Kerschbaum, Eugene H. Spafford, and Diego Zamboni. "Using internal sensors and embedded detectors for intrusion detection". In: *Journal of Computer Security* 10.1,2 (2002), pp. 23–70. URL: [https://www.researchgate.net/publication/220065478\\_Using\\_Internal\\_Sensors\\_and\\_EMBEDDED\\_Detectors\\_for\\_Intrusion\\_Detection](https://www.researchgate.net/publication/220065478_Using_Internal_Sensors_and_EMBEDDED_Detectors_for_Intrusion_Detection).
- [20] Florian Kerschbaum, Eugene H. Spafford, and Diego Zamboni. "Using embedded sensors for detecting network attacks". In: *Proceedings of the 1st ACM Workshop on Intrusion Detection Systems*. Ed. by Deborah Frincke and Dimitris Gritzalis. CERIAS TR 2000-25. ACM SIGSAC. Nov. 2000. URL: [https://www.cerias.purdue.edu/apps/reports\\_and\\_papers/view/1641/](https://www.cerias.purdue.edu/apps/reports_and_papers/view/1641/).
- [21] Eugene H. Spafford and Diego Zamboni. "Intrusion Detection using Autonomous Agents". In: *Computer Networks* 34.4 (Oct. 2000), pp. 547–570. URL: [http://dx.doi.org/10.1016/S1389-1286\(00\)00136-5](http://dx.doi.org/10.1016/S1389-1286(00)00136-5).
- [22] Jai Sundar Balasubramaniyan et al. "An Architecture for Intrusion Detection using Autonomous Agents". In: *Proceedings of the Fourteenth Annual Computer Security Applications Conference*. IEEE Computer Society, Dec. 1998, pp. 13–24. URL: <http://zzamboni.org/files/pubs/aafid-acsac98.pdf>.
- [23] Christoph L. Schuba et al. "Analysis of a Denial of Service Attack on TCP". In: *Proceedings of the 1997 IEEE Symposium on Security and Privacy*. Awarded the 2020 IEEE Security & Privacy Test of Time Award. IEEE Computer Society. IEEE Computer Society Press, May 1997, pp. 208–223. URL: [https://www.cerias.purdue.edu/apps/reports\\_and\\_papers/view/605](https://www.cerias.purdue.edu/apps/reports_and_papers/view/605).
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## Tech Reports

- [25] James Riordan, Diego Zamboni, and Yann Duponchel. *Billy Goat, an Accurate Worm-Detection System*. Research Report RZ3609. IBM Research, Nov. 2005. URL: <https://dominoweb.draco.res.ibm.com/d7c39a9a2e73d870852570060051dfed.html>.
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## Presentations at Conferences and Workshops

- [29] Diego Zamboni and Bill Chapman. *Chaos Heidi vs. Orchard: Self-Disruption and Healing in a Cloud Foundry-Based Service Environment*. Presented at the Cloud Foundry Summit Silicon Valley 2016. Presentation: [https://www.youtube.com/watch?v=Wr4E--kr\\_KE](https://www.youtube.com/watch?v=Wr4E--kr_KE). May 2016. URL: <http://sched.co/6aQ2>.
- [30] Diego Zamboni and Mark Burgess. *The Future of In-Container Configuration Management*. Invited talk at the 2014 Usenix Configuration Management Summit (UCMS'14). June 2014. URL: <https://www.usenix.org/conference/ucms14/summit-program/presentation/zamboni>.
- [31] Mike Svoboda and Diego Zamboni. *Leveraging In-Memory Key Value Stores for Large-Scale Operations*. Invited talk at the 27th Large Installation System Administration (LISA) Conference. Nov. 2013. URL: <https://www.usenix.org/conference/lisa13/leveraging-memory-key-value-stores-large-scale-operations>.

- [32] Eugene H. Spafford and Diego Zamboni. *Design and implementation issues for embedded sensors in intrusion detection*. Presented at the Third International Workshop on Recent Advances in Intrusion Detection (RAID2000). Oct. 2000. URL: <http://zzamboni.org/files/pubs/sensors-raid2000.pdf>.
- [33] Diego Zamboni. *Building a Distributed Intrusion Detection System with Perl*. Presented at The Perl Conference 4.0. Monterey, CA, July 2000. URL: <http://zzamboni.org/files/pubs/tpc40.pdf>.
- [34] Eugene H. Spafford and Diego Zamboni. "New directions for the AAFID architecture". In: *Proceedings of the Second International Workshop on Recent Advances in Intrusion Detection (RAID99)*. Online proceedings, available at <http://www.raid-symposium.org/raid99/>. West Lafayette, IN, Sept. 1999. URL: [https://www.cerias.purdue.edu/apps/reports\\_and\\_papers/view/3487](https://www.cerias.purdue.edu/apps/reports_and_papers/view/3487).
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## Invited Talks and Articles

- [36] Mark Burgess and Diego Zamboni. "CFEngine's Decentralized Approach to Configuration Management". In: *InfoQ* (June 2014). URL: <http://www.infoq.com/articles/cfengine-view-on-it-automation>.
- [37] Diego Zamboni. *Security in the Third Wave of IT Engineering*. Keynote talk, presented at the 2011 Computer Security Congress in Mexico City. Nov. 2011. URL: <https://zzamboni.org/post/security-in-the-third-wave-of-it-engineering/>.
- [38] Martim Carbone, Diego Zamboni, and Wenke Lee. "Taming Virtualization". In: *IEEE Security and Privacy* 6.1 (2008), pp. 65–67. ISSN: 1540-7993. URL: <https://ieeexplore.ieee.org/document/4446700>.
- [39] Diego Zamboni. *From Intrusion Detection to Remediation and Beyond: Evolution, Trends, and Research at IBM*. Invited talk at the annual meeting of the Swiss Chapter of the Sigma XI Honorary Scientific Society. Nov. 2006.
- [40] James Riordan, Andreas Wespi, and Diego Zamboni. "How to Hook Worms". In: *IEEE Spectrum* (May 2005). URL: <https://spectrum.ieee.org/computing/networks/how-to-hook-worms>.
- [41] Diego Zamboni. *Intrusion what? From detection to prevention and beyond*. Talk at the Zurich Information Security Center Information Security Colloquium. Dec. 2005.
- [42] James Riordan and Diego Zamboni. "Billy Goat Detects Worms and Viruses". In: *ERCIM News* 56 (Jan. 2004). URL: [http://www.ercim.org/publication/Ercim\\_News/enw56/riordan.html](http://www.ercim.org/publication/Ercim_News/enw56/riordan.html).
- [43] Diego Zamboni. Diez Años de Aciertos y Fallas — ¿Qué Hemos Aprendido y Qué nos Depara el Futuro en la Seguridad? (*Ten years of hits and misses — what have we learned, and what does the future in security hold for us?*) Keynote talk, presented at the 2004 Computer Security Congress in Mexico City. May 2004.
- [44] Diego Zamboni. "Avances en el sistema y arquitectura AAFID para detección de intrusos (Advances in the AAFID intrusion detection architecture and system)". In: *Proceedings of the 1999 Día Internacional de la Seguridad en Cómputo (International Computer Security Day) conference*. Mexico City, Mexico, Oct. 1999.
- [45] Diego Zamboni. "AAFID: Detección de Intrusos usando Agentes Autónomos (Intrusion Detection using Autonomous Agents)". In: *Proceedings of the 1998 Día Internacional de la Seguridad en Cómputo (International Computer Security Day) conference*. Mexico City, Mexico, Nov. 1998.

## Patents

- [46] Carbone Martim et al. "Hardware Emulation Using On-the-fly Virtualization". Granted Patent US 9250942 B2 (United States). Feb. 2, 2016. URL: <https://lens.org/107-038-681-631-856>.
- [47] Jansen Bernhard et al. "Secure User Interaction Using Virtualization". Granted Patent US 8516564 B2 (United States). Aug. 20, 2013. URL: <https://lens.org/012-709-360-909-626>.
- [48] Zamboni Diego M et al. "Detection And Control Of Peer-to-peer Communication". Patent Family of US 8219679 B2 (United States, others). July 10, 2012. URL: <https://lens.org/151-595-773-205-878>.
- [49] Riordan James F, Rissmann Ruediger, and Zamboni Diego M. "IP Network Management Based On Automatically Acquired Network Entity Status Information". Patent Family of US 8055751 B2 (United States, others). Nov. 8, 2011. URL: <https://lens.org/065-534-634-366-763>.
- [50] Duponchel Yann et al. "Methods For Operating Virtual Networks, Data Network System, Computer Program And Computer Program Product". Patent Family of US 7908350 B2 (United States, others). Mar. 15, 2011. URL: <https://lens.org/080-322-567-493-840>.
- [51] Rissmann Ruediger et al. "Network Attack Detection". Patent Family of EP 1866725 B1 (European Patent Office, others). Oct. 20, 2010. URL: <https://lens.org/044-792-433-937-531>.
- [52] Duponchel Yann et al. "Method For Operating Several Virtual Networks". Patent Family of EP 1969777 B1 (European Patent Office, others). Jan. 27, 2010. URL: <https://lens.org/159-743-880-849-911>.
- [53] Swimmer Morton D, Wespi Andreas, and Zamboni Diego M. "Preventing Attacks In A Data Processing System". Granted Patent US 7555777 B2 (United States). June 30, 2009. URL: <https://lens.org/077-245-544-178-974>.
- [54] Schuba Christoph L et al. "Network Protection For Denial Of Service Attacks". Granted Patent US 6725378 B1 (United States). Apr. 20, 2004. URL: <https://lens.org/009-701-089-204-105>.