

# SEVENTH FRAMEWORK PROGRAMME

Information & Communication Technologies  
Trustworthy ICT

## NETWORK OF EXCELLENCE



A European Network of Excellence in Managing Threats and  
Vulnerabilities in the Future Internet: *Europe for the World*

### 4<sup>th</sup> Periodic Dissemination Report <sup>†</sup> September 2013–November 2014

**Abstract:** This is the final dissemination report of the SysSec project.

|                              |   |
|------------------------------|---|
| Contractual Date of Delivery | November 2014                           |
| Actual Date of Delivery      | January 2015                            |
| Document Dissemination Level | Public                                  |
| Editor                       | Stefano Zanero                          |
| Contributors                 | Antonis Krithinakis, Evangelos Markatos |

The SysSec consortium consists of:

|                                |                      |                 |
|--------------------------------|----------------------|-----------------|
| FORTH-ICS                      | Coordinator          | Greece          |
| Politecnico Di Milano          | Principal Contractor | Italy           |
| Vrije Universiteit Amsterdam   | Principal Contractor | The Netherlands |
| Institut Eurécom               | Principal Contractor | France          |
| IICT-BAS                       | Principal Contractor | Bulgaria        |
| Technical University of Vienna | Principal Contractor | Austria         |
| Chalmers University            | Principal Contractor | Sweden          |
| TUBITAK-BILGEM                 | Principal Contractor | Turkey          |

---

<sup>†</sup> The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 257007.



---

## Document Revisions & Quality Assurance

### Internal Reviewers

1. Davide Balzarotti (EURECOM)
2. Vivi Fragopoulou (FORTH)

### Revisions

| Ver. | Date      | By                             | Overview                                |
|------|-----------|--------------------------------|---|
| 1.2  | 26/1/2015 | <i>Editor</i>                  | Fixed images, fixed delivery date       |
| 1.1  | 15/1/2015 | <i>Editor</i>                  | Added Changelog and template adjustment |
| 1.0  | 10/1/2015 | <i>Editor and contributors</i> | First complete draft.                   |





---

## 1 Executive Summary

This report summarizes the dissemination activities carried out by the SysSec project in the September 2013–November 2014 period. Specifically, in the following pages we will list the papers presented by the consortium in conferences as well as the presentations related to the project made at various events and forums. Any additional coverage of the project by the press and online media is also presented in this document.

During this final year of SysSec the consortium published a total of 62 peer-reviewed papers, plus 34 presentations, talks and seminars.

Moreover, we organized an international school, we interacted with the international press, and with other projects and researchers.

The overall dissemination output of SysSec is an indication of the global excellence and recognition of the project partners.

## 2 Conference and journal papers

Following is the list of peer-reviewed papers that were presented or published in the period September 2013–November 2014.

- [1] Thanasis Petsas, Antonis Papadogiannakis, Michalis Polychronakis, Evangelos P. Markatos, and Thomas Karagiannis. **Rise of the Planet of the Apps: A Systematic Study of the Mobile App Ecosystem.** In *Proceedings of the ACM SIGCOMM Internet Measurement Conference (IMC)*, Barcelona, Spain, October 2013.

Local copy: [papers/petsas-appstores-imc.pdf](#)

Online: <http://syssec-project.eu/nNa#petsas-appstores-imc.pdf>

- [2] Antonis Papadogiannakis, Michalis Polychronakis, and Evangelos P. Markatos. **Scap: Stream-Oriented Network Traffic Capture and Analysis for High-Speed Networks.** In *Proceedings of the ACM SIGCOMM Internet Measurement Conference (IMC)*, Barcelona, Spain, October 2013.

Local copy: [papers/papadog-scap-imc.pdf](#)

Online: <http://syssec-project.eu/nNa#papadog-scap-imc.pdf>

- [3] Mariano Graziano, Andrea Lanzi, and Davide Balzarotti. **Hypervisor Memory Forensics.** In *Symposium on Research in Attacks, Intrusion, and Defenses (RAID)*, Saint Lucia, October 2013.

Local copy: [papers/raid13\\_graziano.pdf](#)

Online: [http://syssec-project.eu/nNa#raid13\\_graziano.pdf](http://syssec-project.eu/nNa#raid13_graziano.pdf)

- 
- [4] Dennis Andriesse, Christian Rossow, Brett Stone-Gross, Daniel Plohmann, and Herbert Bos. **Highly Resilient Peer-to-Peer Botnets Are Here: An Analysis of Gameover Zeus**. In *Proc. of the 8th IEEE International Conference on Malicious and Unwanted Software (MALWARE'13)*, Fajardo, Puerto Rico, USA, October 2013.

Local copy: [papers/zeus\\_malware13.pdf](#)

Online: [http://syssec-project.eu/nNa#zeus\\_malware13.pdf](http://syssec-project.eu/nNa#zeus_malware13.pdf)

- [5] Xi Chen, Asia Slowinska, and Herbert Bos. **Who allocated my memory? Detecting custom memory allocators in C binaries**. In *Proceedings of the 20th Working Conference on Reverse Engineering (WCRE)*, Koblenz, Germany, October 2013.

Local copy: [papers/membrush\\_wcre13.pdf](#)

Online: [http://syssec-project.eu/nNa#membrush\\_wcre13.pdf](http://syssec-project.eu/nNa#membrush_wcre13.pdf)

- [6] Istvan Haller, Asia Slowinska, and Herbert Bos. **MemPick: High-Level Data Structure Detection in C/C++ Binaries**. In *Proceedings of the 20th Working Conference on Reverse Engineering (WCRE)*, Koblenz, Germany, October 2013.

Local copy: [papers/mempick\\_wcre13.pdf](#)

Online: [http://syssec-project.eu/nNa#mempick\\_wcre13.pdf](http://syssec-project.eu/nNa#mempick_wcre13.pdf)

- [7] Valentin Tudor, Magnus Almgren, and Marina Papatriantafilou. **Analysis of the Impact of Data Granularity on Privacy for the Smart Grid**. In *Proceedings of the 12th ACM workshop on Workshop on privacy in the electronic society (WPES)*, Berlin, Germany, November 2013.

Local copy: [papers/p61-tudor.pdf](#)

Online: <http://syssec-project.eu/nNa#p61-tudor.pdf>

- [8] Antonis Papadogiannakis, Laertis Loutsis, Vassilis Papaefstathiou, and Sotiris Ioannidis. **ASIST: Architectural Support for Instruction Set Randomization**. In *Proceedings of the 20th ACM Conference on Computer and Communications Security (CCS)*, Berlin, Germany, November 2013.

Local copy: [papers/papadog-asist-ccs.pdf](#)

Online: <http://syssec-project.eu/nNa#papadog-asist-ccs.pdf>

- [9] Georgios Kontaxis, Elias Athanasopoulos, Georgios Portokalidis, and Angelos D. Keromytis. **SAuth: Protecting User Accounts from Password Database Leaks**. In *Proceedings of the 20th ACM Conference on Computer and Communications Security (CCS)*, Berlin, Germany, November 2013.

Local copy: [papers/kontaxis-sauth-ccs13.pdf](#)

Online: <http://syssec-project.eu/nNa#kontaxis-sauth-ccs13.pdf>

- 
- [10] Stiliyan Georgiev and Zlatogor Minchev. **An Evolutionary Prototyping for Smart Home Inhabitants Wearable Biomonitoring**. In *Proceedings of Conjoint Scientific Seminar Modelling & Control of Information Processes*, Sofia, Bulgaria, November 2013.

Local copy: [papers/sg\\_zm\\_paper\\_imi\\_19\\_nov\\_2013.pdf](#)

Online: [http://syssec-project.eu/nNa#sg\\_zm\\_paper\\_imi\\_19\\_nov\\_2013.pdf](http://syssec-project.eu/nNa#sg_zm_paper_imi_19_nov_2013.pdf)

- [11] Federico Maggi, Andrea Valdi, and Stefano Zanero. **AndroTotal: A Flexible, Scalable Toolbox and Service for Testing Mobile Malware Detectors**. In *Proceedings of the 3rd Annual ACM CCS Workshop on Security and Privacy in Smartphones and Mobile Devices (SPSM)*, Berlin, Germany, November 2013.

Local copy: [papers/spsm07s-maggi.pdf](#)

Online: <http://syssec-project.eu/nNa#spsm07s-maggi.pdf>

- [12] Martina Lindorfer, Matthias Neumayr, Juan Caballero, and Christian Platzer. **POSTER: Cross-Platform Malware: Write Once, Infect Everywhere**. In *Proceedings of the 20th ACM Conference on Computer and Communications Security (CCS)*, Berlin, Germany, November 2013.

Local copy: [papers/lindorfer\\_ccs13.pdf](#)

Online: [http://syssec-project.eu/nNa#lindorfer\\_ccs13.pdf](http://syssec-project.eu/nNa#lindorfer_ccs13.pdf)

- [13] Martina Lindorfer, Bernhard Miller, Matthias Neugschwandtner, and Christian Platzer. **Take a Bite - Finding the Worm in the Apple**. In *Proceedings of the 9th International Conference on Information, Communications and Signal Processing (ICICS)*, Tainan, Taiwan, December 2013.

Local copy: [papers/lindorfer\\_icics13.pdf](#)

Online: [http://syssec-project.eu/nNa#lindorfer\\_icics13.pdf](http://syssec-project.eu/nNa#lindorfer_icics13.pdf)

- [14] Panagiotis Papadopoulos, Antonis Papadogiannakis, Michalis Polychronakis, Apostolis Zarras, Thorsten Holz, and Evan gelos P. Markatos. **k-subscription: Privacy-preserving Microblogging Browsing through Obfuscation**. In *Proceedings of the 2013 Annual Computer Security Applications Conference (ACSAC)*, New Orleans, LA, USA, December 2013.

Local copy: [papers/papadog-k\\_subscription-acsa.pdf](#)

Online: [http://syssec-project.eu/nNa#papadog-k\\_subscription-acsa.pdf](http://syssec-project.eu/nNa#papadog-k_subscription-acsa.pdf)

- [15] Iasonas Polakis, Stamatis Volanis, Elias Athanasopoulos, and Evangelos P. Markatos. **The man who was there: Validating check-ins in location-based services**. In *Proceedings of the 2013 Annual Computer Security Applications Conference (ACSAC)*, New Orleans, LA, USA, December 2013.

---

Local copy: [papers/polakis\\_man\\_acsac2013.pdf](#)

Online: [http://syssec-project.eu/nNa#polakis\\_man\\_acsac2013.pdf](http://syssec-project.eu/nNa#polakis_man_acsac2013.pdf)

- [16] Davide Balzarotti Erik Olivier Blass Aurelien Francillon Travis Goodspeed Moitrayee Gupta Ioannis Koltsidas Jonas Zaddach, Anil Kurmus. **Implementation and Implications of a Stealth Hard-Drive Backdoor.** In *Proceedings of the 2013 Annual Computer Security Applications Conference (ACSAC)*, New Orleans, LA, USA, December 2013.

Local copy: [papers/acsac13\\_zaddach.pdf](#)

Online: [http://syssec-project.eu/nNa#acsac13\\_zaddach.pdf](http://syssec-project.eu/nNa#acsac13_zaddach.pdf)

- [17] Zlatogor Minchev and Luben Boyanov. **Smart Homes Cyberthreats Identification Based on Interactive Training.** In *Proceedings of the 3rd International Conference on Application of Information and Communication Technology and Statistics in Economy and Education (ICAICTSEE)*, Sofia, Bulgaria, December 2013.

Local copy: [papers/IFIP\\_UNWE\\_Conf\\_ZM\\_LB\\_paper.pdf](#)

Online: [http://syssec-project.eu/nNa#IFIP\\_UNWE\\_Conf\\_ZM\\_LB\\_paper.pdf](http://syssec-project.eu/nNa#IFIP_UNWE_Conf_ZM_LB_paper.pdf)

- [18] Gabriele Bonetti, Marco Viglione, Alessandro Frossi, Federico Maggi, and Stefano Zanero. **A Comprehensive Black-box Methodology for Testing the Forensic Characteristics of Solid-state Drives.** In *Proceedings of the 2013 Annual Computer Security Applications Conference (ACSAC)*, New Orleans, LA, USA, December 2013.

Local copy: [papers/ssdforensics-ACSAC-final.pdf](#)

Online: <http://syssec-project.eu/nNa#ssdforensics-ACSAC-final.pdf>

- [19] Jonas Zaddach, Luca Bruno, Aurelien Francillon, and Davide Balzarotti. **Avatar: A Framework to Support Dynamic Security Analysis of Embedded Systems Firmwares.** In *Proceedings of the Network and Distributed System Security Symposium (NDSS)*, San Diego, USA, February 2014.

Local copy: [papers/ndss14\\_zaddach.pdf](#)

Online: [http://syssec-project.eu/nNa#ndss14\\_zaddach.pdf](http://syssec-project.eu/nNa#ndss14_zaddach.pdf)

- [20] Giancarlo Pellegrino and Davide Balzarotti. **Toward Black-Box Detection of Logic Flaws in Web Applications.** In *Proceedings of the Network and Distributed System Security Symposium (NDSS)*, San Diego, USA, February 2014.

Local copy: [papers/ndss14\\_pellegrino.pdf](#)

Online: [http://syssec-project.eu/nNa#ndss14\\_pellegrino.pdf](http://syssec-project.eu/nNa#ndss14_pellegrino.pdf)

- [21] Zlatogor Minchev and Suzan Feimova. **Modern Social Networks Emerging Cyber Threats Identification: A Practical Methodological Framework with Examples.** In *Proceedings of the 6th AFCEA Sixth*

---

Young Scientists Conference 'Future of ICT', Bucharest, Romania, March 2014.

Local copy: [papers/Paper\\_ZM\\_SF\\_6\\_AFCEA\\_Conf\\_Bucharest\\_march\\_2014.pdf](#)

Online: [http://syssec-project.eu/nNa#Paper\\_ZM\\_SF\\_6\\_AFCEA\\_Conf\\_Bucharest\\_march\\_2014.pdf](http://syssec-project.eu/nNa#Paper_ZM_SF_6_AFCEA_Conf_Bucharest_march_2014.pdf)

- [22] Michele Spagnuolo, Federico Maggi, and Stefano Zanero. **BitIodine: Extracting Intelligence from the Bitcoin Network**. In *Proceedings of the 18th International Conference on Financial Cryptography and Data Security, Financial Crypto 2014*, Barbados, March 2014.

Local copy: [papers/spagnuolo\\_bitiodine\\_fc14.pdf](#)

Online: [http://syssec-project.eu/nNa#spagnuolo\\_bitiodine\\_fc14.pdf](http://syssec-project.eu/nNa#spagnuolo_bitiodine_fc14.pdf)

- [23] Zhang Fu, Olaf Landsiedel, Magnus Almgren, and Marina Papatriantafyllou. **Managing your Trees: Insights from a Metropolitan-Scale Low-Power Wireless Network**. In *Proceedings of 3rd Workshop on Communications and Control for Smart Energy Systems (CCSES), IEEE INFOCOM*, Westin Harbour Castle Toronto, ON, Canada, April 2014.

Local copy: [papers/fu\\_ccses14.pdf](#)

Online: [http://syssec-project.eu/nNa#fu\\_ccses14.pdf](http://syssec-project.eu/nNa#fu_ccses14.pdf)

- [24] William Johansson, Martin Svensson, Ulf Larson, Magnus Almgren, and Vincenzo Gulisano. **T-Fuzz: Model-Based Fuzzing for Robustness Testing of Telecommunication Protocols**. In *Proceedings of the 7th International Conference on Software Testing, Verification and Validation (ICST)*, Cleveland, Ohio, USA, April 2014.

Local copy: [papers/johansson\\_TFuzz\\_icst14.pdf](#)

Online: [http://syssec-project.eu/nNa#johansson\\_TFuzz\\_icst14.pdf](http://syssec-project.eu/nNa#johansson_TFuzz_icst14.pdf)

- [25] Thanasis Petsas, Giannis Voyatzis, Elias Athanasopoulos, Michalis Polychronakis, and Sotiris Ioannidis. **Rage Against the Virtual Machine: Hindering Dynamic Analysis of Mobile Malware**. In *Proceedings of the 7th European Workshop on Systems Security (EuroSec)*, Amsterdam, The Netherlands, April 2014.

Local copy: [papers/petsas\\_rage\\_against\\_the\\_virtual\\_machine.pdf](#)

Online: [http://syssec-project.eu/nNa#petsas\\_rage\\_against\\_the\\_virtual\\_machine.pdf](http://syssec-project.eu/nNa#petsas_rage_against_the_virtual_machine.pdf)

- [26] Nick Nikiforakis, Federico Maggi, Gianluca Stringhini, M Zubair Rafique, Wouter Joosen, Christopher Kruegel, Frank Piessens, Giovanni Vigna, and Stefano Zanero. **Stranger Danger: Exploring the Ecosystem of Ad-based URL Shortening Services**. In *Proceedings of the 2014 International World Wide Web Conference (WWW)*, Seoul, Korea, April 2014.

---

Local copy: [papers/nikiforakis-fp215-www2014.pdf](#)

Online: <http://syssec-project.eu/nNa#nikiforakis-fp215-www2014.pdf>

- [27] Farnaz Moradi, Ann-Marie Eklund, Dimitrios Kokkinakis, Tomas Olovsson, and Philippos Tsigas. **A Graph-Based Analysis of Medical Queries of a Swedish Health Care Portal**. In *Proceedings of the Fifth International Workshop on Health Text Mining and Information Analysis (Louhi)*, Gothenburg, Sweden, April 2014.

Local copy: [papers/moradi-Louhi2014.pdf](#)

Online: <http://syssec-project.eu/nNa#moradi-Louhi2014.pdf>

- [28] Farnaz Moradi, Tomas Olovsson, and Philippos Tsigas. **Overlapping Communities for Identifying Misbehavior in Network Communications**. In *Proceedings of the 18th Pacific-Asia Conference on Knowledge Discovery and Data Mining*, Tainan, Taiwan, May 2014.

Local copy: [papers/pakdd14\\_moradi.pdf](#)

Online: [http://syssec-project.eu/nNa#pakdd14\\_moradi.pdf](http://syssec-project.eu/nNa#pakdd14_moradi.pdf)

- [29] Sebastian Neuner, Victor van der Veen, Martina Lindorfer, Markus Huber, Georg Merzdovnik, Martin Mulazzani, and Edgar Weippl. **Enter Sandbox: Android Sandbox Comparison**. In *Proceedings of the IEEE Mobile Security Technologies Workshop (MoST)*, San Jose, CA, USA, May 2014.

Local copy: [papers/most14\\_neuner\\_enter\\_sandbox.pdf](#)

Online: [http://syssec-project.eu/nNa#most14\\_neuner\\_enter\\_sandbox.pdf](http://syssec-project.eu/nNa#most14_neuner_enter_sandbox.pdf)

- [30] Enes Göktaş, Elias Athanasopoulos, Herbert Bos, and Georgios Portokalidis. **Out Of Control: Overcoming Control-Flow Integrity**. In *Proceedings of the 35th IEEE Symposium on Security and Privacy (Oakland)*, San Jose, CA, USA, May 2014.

Local copy: [papers/sp14\\_outofcontrol.pdf](#)

Online: [http://syssec-project.eu/nNa#sp14\\_outofcontrol.pdf](http://syssec-project.eu/nNa#sp14_outofcontrol.pdf)

- [31] Erik Bosman and Herbert Bos. **Framing Signals – A Return to Portable Shellcode**. In *Proceedings of the 35th IEEE Symposium on Security and Privacy (Oakland)*, San Jose, CA, USA, May 2014.

Local copy: [papers/sp14\\_srop.pdf](#)

Online: [http://syssec-project.eu/nNa#sp14\\_srop.pdf](http://syssec-project.eu/nNa#sp14_srop.pdf)

- [32] Rafael A Rodríguez Gómez, Gabriel Maciá Fernández, Pedro García Teodoro, Moritz Steiner, and Davide Balzarotti. **Resource monitoring for the detection of parasite P2P botnets**. *Computer Networks, Elsevier B.V.*, pages 302–311, June 2014.

Local copy: [papers/elsevier14\\_parasite\\_botnets.pdf](#)

Online: [http://syssec-project.eu/nNa#elsevier14\\_parasite\\_botnets.pdf](http://syssec-project.eu/nNa#elsevier14_parasite_botnets.pdf)

- 
- [33] Vincenzo Gulisano, Magnus Almgren, and Marina Papatriantafyllou. **POSTER: METIS: a Two-Tier Intrusion Detection System for Advanced Metering Infrastructures.** In *5th International Conference on Future Energy Systems (ACM e-Energy)*, Cambridge, UK, June 2014.
- Local copy: [papers/e\\_energy\\_poster\\_metis.pdf](#)  
Online: [http://syssec-project.eu/nNa#e\\_energy\\_poster\\_metis.pdf](http://syssec-project.eu/nNa#e_energy_poster_metis.pdf)
- [34] Christian Platzter, Martin Stuetz, and Martina Lindorfer. **Skin Sheriff: A Machine Learning Solution for Detecting Explicit Images.** In *Proceedings of the 2nd International Workshop on Security and Forensics in Communication Systems (ASIACCS-SFCS)*, Kyoto, Japan, June 2014.
- Local copy: [papers/sfcs14\\_platzter\\_skin\\_sheriff.pdf](#)  
Online: [http://syssec-project.eu/nNa#sfcs14\\_platzter\\_skin\\_sheriff.pdf](http://syssec-project.eu/nNa#sfcs14_platzter_skin_sheriff.pdf)
- [35] Markus Kammerstetter, Christian Platzter, and Wolfgang Kastner. **PROSPECT.** In *Proceedings of the 9th ACM Symposium on Information, Computer and Communications Security (ASIACCS 2014)*, Kyoto, Japan, June 2014.
- Local copy: [papers/asiaccs14\\_kammerstetter\\_prospect.pdf](#)  
Online: [http://syssec-project.eu/nNa#asiaccs14\\_kammerstetter\\_prospect.pdf](http://syssec-project.eu/nNa#asiaccs14_kammerstetter_prospect.pdf)
- [36] Jelena Isacenkova and Davide Balzarotti. **Shades of Gray: A Closer Look at Emails in the Gray Area.** In *Proceedings of the 9th ACM Symposium on Information, Computer and Communications Security (ASIACCS 2014)*, Kyoto, Japan, June 2014.
- Local copy: [papers/asiaccs14\\_grayspam.pdf](#)  
Online: [http://syssec-project.eu/nNa#asiaccs14\\_grayspam.pdf](http://syssec-project.eu/nNa#asiaccs14_grayspam.pdf)
- [37] Davide Canali, Leyla Bilge, and Davide Balzarotti. **On the Effectiveness of Risk Prediction Based on Users Browsing Behavior.** In *Proceedings of the 9th ACM Symposium on Information, Computer and Communications Security (ASIACCS 2014)*, Kyoto, Japan, June 2014.
- Local copy: [papers/asiaccs14\\_canali.pdf](#)  
Online: [http://syssec-project.eu/nNa#asiaccs14\\_canali.pdf](http://syssec-project.eu/nNa#asiaccs14_canali.pdf)
- [38] Gábor Pék, Andrea Lanzi, Abhinav Srivastava, Davide Balzarotti, Aurélien Francillon, and Christoph Neumann. **On the Feasibility of Software Attacks on Commodity Virtual Machine Monitors via Direct Device Assignment.** In *Proceedings of the 9th ACM Symposium on Information, Computer and Communications Security (ASIACCS 2014)*, Kyoto, Japan, June 2014.
- Local copy: [papers/asiaccs14\\_pek.pdf](#)  
Online: [http://syssec-project.eu/nNa#asiaccs14\\_pek.pdf](http://syssec-project.eu/nNa#asiaccs14_pek.pdf)



- 
- [39] Michele Carminati, Roberto Caron, Federico Maggi, Ilenia Epifani, and Stefano Zanero. **BankSealer: An Online Banking Fraud Analysis and Decision Support System**. In *Proceedings of the 29th IFIP International Information Security and Privacy Conference*, Marrakech, Morocco, June 2014.

Local copy: [papers/carminati\\_sec14\\_bankSealer.pdf](#)

Online: [http://syssec-project.eu/nNa#carminati\\_sec14\\_bankSealer.pdf](http://syssec-project.eu/nNa#carminati_sec14_bankSealer.pdf)

- [40] Asia Slowinska, Istvan Haller, Andrei Bacs, Silviu Baranga, and Herbert Bos. **Data structure archaeology: scrape away the dirt and glue back the pieces! (Or: automated techniques to recover split and merged variables)**. In *Proceedings of the 11th Conference on Detection of Intrusions and Malware and Vulnerability Assessment (DIMVA)*, Egham, UK, July 2014.

Local copy: [papers/carter\\_dimva14.pdf](#)

Online: [http://syssec-project.eu/nNa#carter\\_dimva14.pdf](http://syssec-project.eu/nNa#carter_dimva14.pdf)

- [41] Dennis Andriess and Herbert Bos. **Instruction-Level Steganography for Covert Trigger-Based Malware**. In *Proceedings of the 11th Conference on Detection of Intrusions and Malware and Vulnerability Assessment (DIMVA)*, Egham, UK, July 2014.

Local copy: [papers/stega\\_dimva14.pdf](#)

Online: [http://syssec-project.eu/nNa#stega\\_dimva14.pdf](http://syssec-project.eu/nNa#stega_dimva14.pdf)

- [42] Cristiano Giuffrida, Kamil Majdanik, Mauro Conti, and Herbert Bos. **I Sensed It Was You: Authenticating Mobile Users with Sensor-enhanced Keystroke Dynamics**. In *Proceedings of the 11th Conference on Detection of Intrusions and Malware and Vulnerability Assessment (DIMVA)*, Egham, UK, July 2014.

Local copy: [papers/sense\\_dimva14.pdf](#)

Online: [http://syssec-project.eu/nNa#sense\\_dimva14.pdf](http://syssec-project.eu/nNa#sense_dimva14.pdf)

- [43] Martina Lindorfer, Stamatis Volanis, Alessandro Sisto, Matthias Neugschwandtner, Elias Athanasopoulos, Federico Maggi, Christian Platzer, Stefano Zanero, and Sotiris Ioannidis. **AndRadar: Fast Discovery of Android Applications in Alternative Markets**. In *Proceedings of the 11th Conference on Detection of Intrusions and Malware and Vulnerability Assessment (DIMVA)*, Egham, UK, July 2014.

Local copy: [papers/lindorfer\\_dimva14\\_andradar.pdf](#)

Online: [http://syssec-project.eu/nNa#lindorfer\\_dimva14\\_andradar.pdf](http://syssec-project.eu/nNa#lindorfer_dimva14_andradar.pdf)

- [44] Stefano Schiavoni, Federico Maggi, Lorenzo Cavallaro, and Stefano Zanero. **Phoenix: DGA-Based Botnet Tracking and Intelligence**. In



---

*Proceedings of the 11th Conference on Detection of Intrusions and Malware and Vulnerability Assessment (DIMVA)*, Egham, UK, July 2014.

Local copy: [papers/schiavoni-dimva14-phoenix.pdf](#)

Online: <http://syssec-project.eu/nNa#schiavoni-dimva14-phoenix.pdf>

- [45] Claudio Criscione, Fabio Bosatelli, Stefano Zanero, and Federico Maggi. **Zarathustra: Extracting WebInject Signatures from Banking Trojans**. In *Proceedings of the 12th Annual International Conference on Privacy, Security and Trust (PST)*, Toronto, Canada, July 2014.

Local copy: [papers/criscione-PST2014.pdf](#)

Online: <http://syssec-project.eu/nNa#criscione-PST2014.pdf>

- [46] Sergey Bratus, Iván Arce, Michael E. Locasto, and Stefano Zanero. **Why Offensive Security Needs Engineering Textbooks: Or, How to Avoid a Replay of “Crypto Wars” in Security Research**. *login*, 39:302–311, August 2014.

Local copy: [papers/zanero\\_login.pdf](#)

Online: [http://syssec-project.eu/nNa#zanero\\_login.pdf](http://syssec-project.eu/nNa#zanero_login.pdf)

- [47] Farnaz Moradi, Tomas Olovsson, and Philippas Tsigas. **A Local Seed Selection Algorithm for Overlapping Community Detection**. In *Proceedings of the 2014 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM'14)*, Beijing, China, August 2014.

Local copy: [papers/asonam14\\_moradi.pdf](#)

Online: [http://syssec-project.eu/nNa#asonam14\\_moradi.pdf](http://syssec-project.eu/nNa#asonam14_moradi.pdf)

- [48] Enes Göktas, Elias Athanasopoulos, Michalis Polychronakis, Herbert Bos, and Georgios Portokalidis. **Size Does Matter - Why Using Gadget-Chain Length to Prevent Code-reuse Attacks is Hard**. In *Proceedings of the 23rd USENIX Security Symposium*, San Diego, CA, USA, August 2014.

Local copy: [papers/sec14-paper-goktas.pdf](#)

Online: <http://syssec-project.eu/nNa#sec14-paper-goktas.pdf>

- [49] Andrei Costin, Jonas Zaddach, Francillon Aurélien, and Davide Balzarotti. **A Large Scale Analysis of the Security of Embedded Firmwares**. In *Proceedings of the 23rd USENIX Security Symposium (USENIX Security)*, San Diego, CA, USA, August 2014.

Local copy: [papers/usenixsec14\\_costin.pdf](#)

Online: [http://syssec-project.eu/nNa#usenixsec14\\_costin.pdf](http://syssec-project.eu/nNa#usenixsec14_costin.pdf)

- [50] Vincenzo Gulisano, Magnus Almgren, and Marina Papatriantafilou. **METIS: a Two-Tier Intrusion Detection System for Advanced Me-**

---

**tering Infrastructures.** In *Proceedings of the 10th International Conference on Security and Privacy in Communication Networks (SecureComm)*, Beijing, China, September 2014.

Local copy: [papers/Gulisano.METIS.pdf](#)

Online: [http://syssec-project.eu/nNa#Gulisano\\_METIS.pdf](http://syssec-project.eu/nNa#Gulisano_METIS.pdf)

- [51] Martina Lindorfer, Matthias Neugschwandtner, Lukas Weichselbaum, Yanick Fratantonio, Victor van der Veen, and Christian Platzer. **ANDRUBIS - 1,000,000 Apps Later: A View on Current Android Malware Behaviors.** In *Proceedings of the 3rd International Workshop on Building Analysis Datasets and Gathering Experience Returns for Security (BADGERS)*, Wroclaw, Poland, September 2014.

Local copy: [papers/andrubis\\_badgers2014.pdf](#)

Online: [http://syssec-project.eu/nNa#andrubis\\_badgers2014.pdf](http://syssec-project.eu/nNa#andrubis_badgers2014.pdf)

- [52] Martin Jauernig, Matthias Neugschwandtner, Christian Platzer, and Paolo Milani Comparetti. **LOBOTOMY An Architecture for JIT Spraying Mitigation.** In *Proceedings of the International Conference on Availability, Reliability and Security (ARES)*, Fribourg, Switzerland, September 2014.

Local copy: [papers/lobotomy\\_ares2014.pdf](#)

Online: [http://syssec-project.eu/nNa#lobotomy\\_ares2014.pdf](http://syssec-project.eu/nNa#lobotomy_ares2014.pdf)

- [53] Antonis Papadogiannakis, Michalis Polychronakis, and Evangelos P. Markatos. **Stream-Oriented Network Traffic Capture and Analysis for High-Speed Networks.** *IEEE Journal on Selected Areas in Communications (JSAC), Special Issue on Deep Packet Inspection: Algorithms, Hardware, and Applications*, 32:1–15, October 2014.

Local copy: [papers/papadog\\_scap.pdf](#)

Online: [http://syssec-project.eu/nNa#papadog\\_scap.pdf](http://syssec-project.eu/nNa#papadog_scap.pdf)

- [54] Zlatogor Minchev, Vladimir Dimitrov, Milena Tulechka, and Luben Boyanov. **Multimedia as an Emerging Cyberthreat in Modern Social Networks.** In *Proceedings of the International Conference Automatics & Informatics '14*, Sofia, Bulgaria, October 2014.

Local copy: [papers/zm\\_vd\\_mt\\_lb\\_a\\_i.2014.pdf](#)

Online: [http://syssec-project.eu/nNa#zm\\_vd\\_mt\\_lb\\_a\\_i.2014.pdf](http://syssec-project.eu/nNa#zm_vd_mt_lb_a_i.2014.pdf)

- [55] Zhang Fu, Magnus Almgren, Olaf Landsiedel, and Marina Papatriantafillou. **Online Temporal-Spatial Analysis for Detection of Critical Events in Cyber-Physical Systems.** In *Proceedings of the 2014 IEEE International Conference on Big Data (IEEE BigData 2014)*, Washington DC, USA, October 2014.

---

Local copy: [papers/zhang\\_ts.clustering.pdf](#)

Online: [http://syssec-project.eu/nNa#zhang\\_ts.clustering.pdf](http://syssec-project.eu/nNa#zhang_ts.clustering.pdf)

- [56] Vincenzo Gulisano, Magnus Almgren, and Marina Papatriantafilou. **Online and Scalable Data Validation in Advanced Metering Infrastructures.** In *Proceedings of the 5th IEEE PES Innovative Smart Grid Technologies (ISGT) European 2014 Conference*, Istanbul, Turkey, October 2014.

Local copy: [papers/Gulisano\\_ISGT.pdf](#)

Online: [http://syssec-project.eu/nNa#Gulisano\\_ISGT.pdf](http://syssec-project.eu/nNa#Gulisano_ISGT.pdf)

- [57] Farnaz Moradi. *Improving Community Detection Methods for Network Data Analysis.* Doktorsavhandlingar vid Chalmers tekniska h.gskola. Ny serie, no: 3722. Institutionen for data - och informationsteknik, Natverk och system (Chalmers) , Chalmers tekniska hogskola, 2014. 132.

- [58] Nikos Tsikoudis, Antonis Papadogiannakis, and Evangelos P. Markatos. **LEONIDS: a Low-latency and Energy-efficient Network-level Intrusion Detection System.** *IEEE Transactions on Emerging Topics in Computing (TETC), Special Issue on Emerging Topics in Cyber Security*, PP(99):1–1, November 2014.

Local copy: [papers/leonids.pdf](#)

Online: <http://syssec-project.eu/nNa#leonids.pdf>

- [59] Iasonas Polakis, Panagiotis Ilia, Federico Maggi, Marco Lancini, Georgios Kontaxis, Stefano Zanero, Sotiris Ioannidis, and Angelos D. Keromytis. **Faces in the Distorting Mirror: Revisiting Photo-based Social Authentication.** In *Proceedings of the 21st ACM Conference on Computer and Communications Security (CCS)*, Arizona, USA, November 2014.

Local copy: [papers/polakis\\_ccs2014.pdf](#)

Online: [http://syssec-project.eu/nNa#polakis\\_ccs2014.pdf](http://syssec-project.eu/nNa#polakis_ccs2014.pdf)

- [60] Z. Minchev and L. Boyanov. **Smart homes cyberthreats identification based on interactive training.** In *Proceedings of ICAICTSEE 2014*, University of National and World Economy, Sofia, Bulgaria, November 2014.

Local copy: [papers/minchevnov14\\_ICAICTSEE.pdf](#)

Online: [http://syssec-project.eu/nNa#minchevnov14\\_ICAICTSEE.pdf](http://syssec-project.eu/nNa#minchevnov14_ICAICTSEE.pdf)

- [61] Zlatogor Minchev. **Cyber threats analysis in on-line social networks with a study on user response.** Technical report, November 2014.

Local copy: [papers/minchevnov14\\_IT4Sec.pdf](#)

Online: [http://syssec-project.eu/nNa#minchevnov14\\_IT4Sec.pdf](http://syssec-project.eu/nNa#minchevnov14_IT4Sec.pdf) .

- 
- [62] Giorgos Vasiliadis, Elias Athanasopoulos, Michalis Polychronakis, and Sotiris Ioannidis. **PixelVault: Using GPUs for securing cryptographic operations**. In *Proceedings of the 21st ACM Conference on Computer and Communications Security (CCS)*, Scottsdale, AZ, USA, November 2014.

Local copy: [papers/ccsfp314s-vasiliadis.pdf](#)

Online: <http://syssec-project.eu/nNa#ccsfp314s-vasiliadis.pdf>

### 3 Conference and journal papers that will appear in the near future

Although they were not reported in our bimonthly reports, because by policy we reported only papers presented during the project, we would like to present a list of peer-reviewed papers that were prepared and submitted during the SysSec project, which are accepted and are going to appear in future conferences and journal issues. These, even if not technically claimed as project papers, are nevertheless positive results and impact of the project.

- [1] Dennis Andriesse Herbert Bos Cristiano Giuffrida Xi Chen, Asia Slowinska. **StackArmor: Comprehensive protection from stack-based memory error vulnerabilities for binaries**. In *Proceedings of NDSS'15*, February 2015.

Local copy: [papers/notyetavailable](#)

Online: <http://syssec-project.eu/nNa#notyetavailable>

- [2] Istvan Haller Matthias Neugschwandtner, Paolo Milani Comparetti and Herbert Bos. **The borg: Nanoprobing binaries for buffer overreads**. In *Proceedings of CODASPY*, San Antonio, Texas, March 2015.

Local copy: [papers/notyetavailable](#)

Online: <http://syssec-project.eu/nNa#notyetavailable>

- [3] Herbert Bos Xi Chen, Asia Slowinska. **On the detection of custom memory allocators in c binaries**. *Empirical Software Engineering*, 2015.

Local copy: [papers/notyetavailable](#)

Online: <http://syssec-project.eu/nNa#notyetavailable>

- [4] Valentin Tudor, Magnus Almgren, and Marina Papatriantafilou. **Harnessing the unknown in advanced metering infrastructure traffic**. In *Proceedings of the 30th ACM Symposium On Applied Computing, SAC '15*, New York, NY, USA, 2015. ACM.

Local copy: [papers/notyetavailable](#)

Online: <http://syssec-project.eu/nNa#notyetavailable>

---

## 4 Talks, seminars and presentations

- [1] Zlatogor Minchev. **Cyber Risks & Threats. State of the Art & Future trends (A Comprehensive Methodological Overview with Examples)**. At *NATO Regional Summer School on Cyber Defence (RSSCD)*, Ohrid, FYROM, October 2013.

Local copy: [talks/ZM\\_NATO\\_RSSCD\\_Ohrid\\_Talk.pdf](#)

Online: [http://syssec-project.eu/jNa#ZM\\_NATO\\_RSSCD\\_Ohrid\\_Talk.pdf](http://syssec-project.eu/jNa#ZM_NATO_RSSCD_Ohrid_Talk.pdf)

- [2] Federico Maggi. **AndroTotal: A Scalable Framework for Android Antimalware Testing**. At *Conference on Telecommunications and IT Security (SECURE)*, Warszawa, Poland, October 2013.

Local copy: [talks/fm\\_andrototal\\_secure2013.pdf](#)

Online: [http://syssec-project.eu/jNa#fm\\_andrototal\\_secure2013.pdf](http://syssec-project.eu/jNa#fm_andrototal_secure2013.pdf)

- [3] Zlatogor Minchev Stiliyan Georgiev. **An Evolutionary Prototyping for Smart Home Inhabitants Wearable Biomonitoring**. At *Conjoint Scientific Seminar Modelling & Control of Information Processes*, Sofia, Bulgaria, November 2013.

Local copy: [talks/sg\\_zm\\_talk\\_imi\\_19\\_nov\\_2013.pdf](#)

Online: [http://syssec-project.eu/jNa#sg\\_zm\\_talk\\_imi\\_19\\_nov\\_2013.pdf](http://syssec-project.eu/jNa#sg_zm_talk_imi_19_nov_2013.pdf)

- [4] Zlatogor Minchev. **Cybersecurity Research Experience and Development Perspectives in the Modern Security Environment**. At *International Conference Smart Defence, Cybersecurity and Open Doors Policy: The New Euro-Atlantic Security Synergies, PanEuropa - Bulgaria with NATO Public Diplomacy Division support, European Commission Residence*, Sofia, Bulgaria, November 2013.

Local copy: [talks/zm\\_paneuropa\\_conf\\_talk\\_27\\_nov\\_2013.pdf](#)

Online: [http://syssec-project.eu/jNa#zm\\_paneuropa\\_conf\\_talk\\_27\\_nov\\_2013.pdf](http://syssec-project.eu/jNa#zm_paneuropa_conf_talk_27_nov_2013.pdf)

- [5] Stefano Zanero. **Tracking and Characterizing Botnets Using Automatically Generated Domain**. At *Stevens Institute of Technology, CS Department*, Hoboken, New Jersey, November 2013.

Local copy: [talks/sz-talk-stevens-19-nov.pdf](#)

Online: <http://syssec-project.eu/jNa#sz-talk-stevens-19-nov.pdf>

- [6] Federico Maggi. **Modern Botnets and the Rise of Automatically Generated Domains**. At *INFOSEK*, Nova Gorica, Slovenia, November 2013.

Local copy: [talks/fm\\_botnets\\_infosek2013.pdf](#)

Online: [http://syssec-project.eu/jNa#fm\\_botnets\\_infosek2013.pdf](http://syssec-project.eu/jNa#fm_botnets_infosek2013.pdf)

- [7] Federico Maggi. **AndroTotal: A Scalable Framework for Android Antivirus Testing**. At *INFOSEK*, Nova Gorica, Slovenia, November 2013.

- 
- Local copy: [talks/fm\\_andrototal\\_infosek2013.pdf](#)  
Online: [http://syssec-project.eu/jNa#fm\\_andrototal\\_infosek2013.pdf](http://syssec-project.eu/jNa#fm_andrototal_infosek2013.pdf)
- [8] Luben Boyanov Zlatogor Minchev. **Smart Homes Cyberthreats Identification Based on Interactive Training**. At *ICAICTSEE 2013, University of National and World Economy*, Sofia, Bulgaria, December 2013.  
Local copy: [talks/zm\\_lb\\_smart\\_home\\_unwe\\_icaictsee\\_2013\\_talk\\_6\\_dec\\_2013.pdf](#)  
Online: [http://syssec-project.eu/jNa#zm\\_lb\\_smart\\_home\\_unwe\\_icaictsee\\_2013\\_talk\\_6\\_dec\\_2013.pdf](http://syssec-project.eu/jNa#zm_lb_smart_home_unwe_icaictsee_2013_talk_6_dec_2013.pdf)
- [9] Federico Maggi. **Malicious Android Apps: Overview, Status and Dilemmas**. At *Qualcomm*, San Diego, USA, January 2014.  
Local copy: [talks/fm\\_android\\_malware\\_qualcomm.pdf](#)  
Online: [http://syssec-project.eu/jNa#fm\\_android\\_malware\\_qualcomm.pdf](http://syssec-project.eu/jNa#fm_android_malware_qualcomm.pdf)
- [10] Stefano Zanero. **Behavior-based Methods for Automated, Scalable Malware Analysis**. At *INRIA*, Rennes, France, February 2014.  
Local copy: [talks/Zanero-INRIA.pdf](#)  
Online: <http://syssec-project.eu/jNa#Zanero-INRIA.pdf>
- [11] Evangelos Markatos. **The rise of the Big Data era: The case for Network Monitoring**. At *SWITCH*, Zurich, Switzerland, March 2014.  
Local copy: [talks/markatos-ETHZ-March31.pptx](#)  
Online: <http://syssec-project.eu/jNa#markatos-ETHZ-March31.pptx>
- [12] Zlatogor Minchev and Suzan Feimova. **Modern Social Networks Emerging Cyber Threats Identification: A Practical Methodological Framework with Examples**. At *6th AFCEA Sixth Young Scientists Conference 'Future of ICT'*, Bucharest, Romania, March 2014.  
Local copy: [talks/ZM\\_SF\\_6\\_AFCEA\\_Conf\\_Bucharest\\_march\\_2014.pdf](#)  
Online: [http://syssec-project.eu/jNa#ZM\\_SF\\_6\\_AFCEA\\_Conf\\_Bucharest\\_march\\_2014.pdf](http://syssec-project.eu/jNa#ZM_SF_6_AFCEA_Conf_Bucharest_march_2014.pdf)
- [13] Magnus Almgren, Zhang Fu, Vincenzo Gulisano, Marina Papatriantafilou, and Valentin Tudor. **Cybersecurity and Data Management in the Smart Grid**. At *Big Data Area of Advance Initiative Seminar*, Gothenburg, Sweden, March 2014.  
Local copy: [talks/cybersecurity\\_big\\_data\\_seminar\\_poster\\_2014.pdf](#)  
Online: [http://syssec-project.eu/jNa#cybersecurity\\_big\\_data\\_seminar\\_poster\\_2014.pdf](http://syssec-project.eu/jNa#cybersecurity_big_data_seminar_poster_2014.pdf)
- [14] Sotiris Ioannidis. **The Cost of Cyber-Insecurity**. At *Safety & Security in Cyber Space: Building up Trust in the EU conference*, Athens, Greece, March 2014.  
Local copy: [talks/sotiris-cost-of-cyber-insecurity.pdf](#)  
Online: <http://syssec-project.eu/jNa#sotiris-cost-of-cyber-insecurity.pdf>

- 
- [15] Evangelos Markatos. **Secure ICT Landscape Deliverable**. At *NIS WG3 3rd meeting*, Brussels, Belgium, April 2014.
- Local copy: [talks/NIS-WG3-Apr-29th-meeting-Landscape-Deliverable.pptx](#)  
Online: <http://syssec-project.eu/jNa#NIS-WG3-Apr-29th-meeting-Landscape-Deliverable.pptx>
- [16] Zlatogor Minchev. **Identification of Future Cyber Threats: Research Experience and Development Perspectives**. At *Ninth Scientific Conference of the International Information Security Research Consortium*, Garmisch-Partenkirchen, Germany, April 2014.
- Local copy: [talks/zm\\_garmish\\_talk\\_april\\_24\\_2014.pdf](#)  
Online: [http://syssec-project.eu/jNa#zm\\_garmish\\_talk\\_april\\_24\\_2014.pdf](http://syssec-project.eu/jNa#zm_garmish_talk_april_24_2014.pdf)
- [17] Evangelos Markatos. **Secure ICT Landscape Deliverable**. At *Trust In The Digital World conference*, Vienna, Austria, April 2014.
- Local copy: [talks/INT\\_TrustInDigitalWorld\\_20140408.LandscapeDeliverable.Markatos.ppt](#)  
Online: [http://syssec-project.eu/jNa#INT\\_TrustInDigitalWorld\\_20140408.LandscapeDeliverable.Markatos.ppt](http://syssec-project.eu/jNa#INT_TrustInDigitalWorld_20140408.LandscapeDeliverable.Markatos.ppt)
- [18] Zlatogor Minchev and Emil Kelevedjiev. **Multicriteria Assessment Scale of Future Cyber threats Identification**. At *International Conference 'Mathematics Days in Sofia'*, Sofia, Bulgaria, July 2014.
- Local copy: [talks/zm\\_ek\\_mds\\_2014\\_talk\\_july\\_2014.pdf](#)  
Online: [http://syssec-project.eu/jNa#zm\\_ek\\_mds\\_2014\\_talk\\_july\\_2014.pdf](http://syssec-project.eu/jNa#zm_ek_mds_2014_talk_july_2014.pdf)
- [19] Zlatogor Minchev. **Virtual Assistants in Modern Cyber World . Challenges & Threats**. At *XIV Summer School on Mathematics and Informatics (LISH14)*, Varna, Bulgaria, August 2014.
- Local copy: [talks/zm\\_lish14\\_course\\_talk\\_varna\\_aug\\_2014.pdf](#)  
Online: [http://syssec-project.eu/jNa#zm\\_lish14\\_course\\_talk\\_varna\\_aug\\_2014.pdf](http://syssec-project.eu/jNa#zm_lish14_course_talk_varna_aug_2014.pdf)
- [20] Evangelos Markatos. **Hot topics in Security Research - the Red Book**. At *ForToo Final Workshop*, Brussels, Belgium, August 2014.
- Local copy: [talks/markatos-fortoo-workshop-30-9-2014.pdf](#)  
Online: <http://syssec-project.eu/jNa#markatos-fortoo-workshop-30-9-2014.pdf>
- [21] Sotiris Ioannidis. **Security and Privacy Research Challenges**. At *ERCIM Security and Privacy expert group*, Wroclaw, Poland, September 2014.
- Local copy: [talks/sotiris-ERCIM.pdf](#)  
Online: <http://syssec-project.eu/jNa#sotiris-ERCIM.pdf>



- 
- [22] Zlatogor Minchev. **Audio-Visual Entrainment Influence on Postural Dynamics**. At *International Workshop on Posture, Balance & the Brain*, Thessaloniki, Greece, September 2014.
- Local copy: [talks/ZM\\_Thessaloniki\\_Talk\\_13\\_09\\_2014.pdf](#)  
Online: [http://syssec-project.eu/jNa#ZM\\_Thessaloniki\\_Talk\\_13.09.2014.pdf](http://syssec-project.eu/jNa#ZM_Thessaloniki_Talk_13.09.2014.pdf)
- [23] Evangelos Markatos. **Hot topics in Security Research - the Red Book**. At *FIRE Final Event*, Brussels, Belgium, October 2014.
- Local copy: [talks/markatos-FIRE-workshop-13-10-2014.pdf](#)  
Online: <http://syssec-project.eu/jNa#markatos-FIRE-workshop-13-10-2014.pdf>
- [24] Evangelos Markatos. **Stream - Oriented Network Packet Capture. Hot topics in Security Research - The Red Book**. At *HIPEAC*, Athens, Greece, October 2014.
- Local copy: [talks/markatos-hipeac-athens-10-10-2014.pdf](#)  
Online: <http://syssec-project.eu/jNa#markatos-hipeac-athens-10-10-2014.pdf>
- [25] Evangelos Markatos. **Secure ICT Landscape Deliverable**. At *NIS WG3 meeting*, Florence, Italy, October 2014.
- Local copy: [talks/markatos-NIS-WG3-meeting-Landscape-Deliverable-October-8th.pdf](#)  
Online: <http://syssec-project.eu/jNa#markatos-NIS-WG3-meeting-Landscape-Deliverable-October-8th.pdf>
- [26] Zlatogor Minchev and Luben Boyanov. **Interactive Virtual Avatars. Design & Application Challenges for Future Smart Homes**. At *ICAICTSEE - 2014, University of National and World Economy*, Sofia, Bulgaria, October 2014.
- Local copy: [talks/zm\\_lb\\_smart\\_home\\_unwe\\_ICAICTSEE\\_2014\\_talk.pdf](#)  
Online: [http://syssec-project.eu/jNa#zm\\_lb\\_smart\\_home\\_unwe\\_ICAICTSEE\\_2014\\_talk.pdf](http://syssec-project.eu/jNa#zm_lb_smart_home_unwe_ICAICTSEE_2014_talk.pdf)
- [27] Milena Tulechka Luben Boyanov Zlatogor Minchev, Vladimir Dimitrov. **Multimedia as an Emerging Cyberthreat in Modern Social Networks**. At *International Conference "Automatics & Informatics '14*, Sofia, Bulgaria, October 2014.
- Local copy: [talks/zm\\_vd\\_mt\\_lb\\_a\\_i\\_2014\\_talk.pdf](#)  
Online: [http://syssec-project.eu/jNa#zm\\_vd\\_mt\\_lb\\_a\\_i\\_2014\\_talk.pdf](http://syssec-project.eu/jNa#zm_vd_mt_lb_a_i_2014_talk.pdf)
- [28] Stefano Zanero. **Automatic, unsupervised, scalable extraction and semantic tagging of (interesting) behaviors**. At *Microsoft BlueHat Conference*, Seattle, WA, October 2014.
- Local copy: [talks/zanero-bluehat-jackdaw.pdf](#)  
Online: <http://syssec-project.eu/jNa#zanero-bluehat-jackdaw.pdf>



- 
- [29] Stefano Zanero. **Automatic, unsupervised, scalable extraction and semantic tagging of (interesting) behaviors**. At *Hack In The Box security conference*, Kuala Lumpur, Malaysia, October 2014.

Local copy: [talks/zanero-jackdaw-HITB.pdf](#)

Online: <http://syssec-project.eu/jNa#zanero-jackdaw-HITB.pdf>

- [30] Stefano Zanero. **PHOENIX & CERBERUS: We haz botnets!**. At *Microsoft BlueHat Conference*, Seattle, WA, October 2014.

Local copy: [talks/zanero-bluehat-phoenix.pdf](#)

Online: <http://syssec-project.eu/jNa#zanero-bluehat-phoenix.pdf>

- [31] Stefano Zanero. **Automatic, unsupervised, scalable extraction and semantic tagging of (interesting) behaviors**. At *Invited talk, Waseda University*, Tokyo, Japan, October 2014.

Local copy: [talks/zanero-waseda.pdf](#)

Online: <http://syssec-project.eu/jNa#zanero-waseda.pdf>

- [32] Evangelos Markatos. **Privacy-Preserving Social Plugins**. At *MIT DB Group*, Cambridge, England, November 2014.

Local copy: [talks/markatos-mit.pdf](#)

Online: <http://syssec-project.eu/jNa#markatos-mit.pdf>

- [33] Zlatogor Minchev. **Human Factor Dual Role in Modern Cyberspace Social Engineering**. At *NATO Advanced Training Course “Terrorist Use of Cyberspace”*, Ohrid, FYROM, December 2014.

Local copy: [talks/zm\\_talk\\_nato\\_atc\\_dec\\_9\\_2014.pdf](#)

Online: [http://syssec-project.eu/jNa#zm\\_talk\\_nato\\_atc\\_dec\\_9\\_2014.pdf](http://syssec-project.eu/jNa#zm_talk_nato_atc_dec_9_2014.pdf)

- [34] Zlatogor Minchev and Plamen Gatev. **Audio-Visual Entrainment Application in Smart Environment for Users Psychophysiological Response Methodological Study**. At *Jubilee Scientific Conference “Neuroscience - from Theory to Experiment”*, Sofia, Bulgaria, December 2014.

Local copy: [talks/zm\\_pg\\_inb\\_jub\\_conf\\_talk\\_dec\\_4\\_2014.pdf](#)

Online: [http://syssec-project.eu/jNa#zm\\_pg\\_inb\\_jub\\_conf\\_talk\\_dec\\_4\\_2014.pdf](http://syssec-project.eu/jNa#zm_pg_inb_jub_conf_talk_dec_4_2014.pdf)

## 5 2<sup>nd</sup> Summer School

The 2<sup>nd</sup> SysSec Summer School<sup>1</sup> took place at Vrije Universiteit (VU) Amsterdam, Thursday September 25 to Friday September 26, 2014. Its main topic was **Mobile Malware** with a special focus on **reverse-engineering and analyzing Android malware**.

---

<sup>1</sup> <http://www.syssec-project.eu/events/summer-school-2014/>

One of the goals of the 2014 SysSec Summer School was to be light in theory and rich in practical exercises. We wanted the students to **learn from the experts** and **develop skills** in analyzing mobile malware. The first day focused on general static and dynamic application analysis with lectures and practical exercises, while the second day focused on lectures highlighting more advanced techniques in dynamic analysis. Also, towards the end of the summerschool, a malware competition was held for the participants.

### 5.1 Attendance

The registration for the Summer School opened on July 23 with announcements through our social media channels and to our mailing lists in the following couple of days. In that period a total of about 55 participants expressed their interest to participate. The number of applications exceeded the capacity of the rooms available for the event, so we had to close the registration and create a waiting list. After changing the arrangements for the rooms, we managed to admit 42 of these to the Summer School.

The school was free for students affiliated with an academic institution. All participants had to cover their travel and local costs themselves. Having to pay for one's own costs didn't seem to bar any students from attending, which is an indication that they found the speakers and topics so interesting and useful for their future.

### 5.2 Organization Committee

The summer school organizing committee was the following.

- **Program Chair:** Sotiris Ioannidis, FORTH
- **Local Arrangement Chair:** Victor van der Veen, VU University Amsterdam
- **Program Committee:**
  - Magnus Almgren, Chalmers University of Technology
  - Davide Balzarotti, Institut Eurecom
  - Herbert Bos, VU University Amsterdam
  - Christian Platzer, Vienna University of Technology

### 5.3 Speakers & Programme

We had six different speakers. The list of speakers and their affiliations were as following:

- Elias Athanasopoulos, FORTH

|   |      |
|---|------|
| <b>Day 1: Introductory tutorial, tools, and static analysis</b>                       |      |
| <b>Welcome and VM installation</b>  | 45'  |
| <b>Session I - Introduction and meta-data analysis</b><br><i>Elias Athanasopoulos</i> | 105' |
| <b>Session II - Static analysis</b><br><i>Federico Maggi</i>                          | 105' |
| <b>Session III - Dynamic analysis</b><br><i>Matthias Neugschwandtner</i>              | 75'  |
| <b>Session IV - Current and future research</b><br><i>Herbert Bos</i>                 | 60'  |
| <b>Day 2: Dynamic analysis, revision, and future directions</b>                       |      |
| <b>Session V - Advanced dynamic analysis</b><br><i>Victor van der Veen</i>            | 3h   |
| <b>Session VI - Evading dynamic analysis environments</b><br><i>Thanasis Petsas</i>   | 100' |
| <b>Session VII - CTF competition</b><br><i>Federico Maggi</i>                         | 105' |

Table 1: Programme of the 2<sup>nd</sup> SysSec Summer School

- Federico Maggi, PoliMi
- Matthias Neugschwandtner, TUV
- Herbert Bos, VU University Amsterdam
- Victor van der Veen, VU University Amsterdam
- Thanasis Petsas, FORTH

The topics covered in the two days can be seen in Table 1.



Figure 1: Elias Athanasopoulos giving an introduction to the Android ecosystem.

### 5.3.1 Covered Topics

**Day 1:** The tutorials and lectures held during the first day of the summerschool, covered an introduction to the Android operating system and ways to analyze Android applications. Elias Athanasopoulos explained the Android ecosystem and presented the Android Emulator, as well as the required tools which were used throughout the summerschool (see Figure 1).

During the second session of the first day, Federico Maggi presented the Dalvik virtual machine (see Figure 2), a fundamental part of Android OS that executes the Android applications. Federico taught students how to disassemble, decompile, unpack and modify functionality of Dalvik bytecode of Android applications.

Finally, Matthias Neugschwandtner discussed about the importance of dynamic analysis in application malware analysis. Matthias also presented Andrubis, an extension for Anubis which is designed to analyze unknown Android applications (APKs) and AndroTotal, a free service that allows researchers to automatically scan Android apps against various Android AV products.



Figure 2: Federico Maggi is about to teach Android malware static analysis.

After each tutorial, the students were given various challenges, e.g., to reverse engineer and analyze a set of suspicious applications. There were also walkthroughs to explain how solutions should be implemented. During the exercises, tutors also walked around helping students with the fulfilment of the given exercises (see Figure 3).

**Day 2:** The second day, the lectures focused on highlighting more advanced techniques in dynamic analysis of mobile applications. Victor Van Der Veen introduced advanced malware tactics, such as dynamic code loading and permission circumvention. Victor also presented in detail the Trace-Droid platform, a dynamic analysis tool for Android applications (see Figure 4).

During the second session of the second day, Thanasis Petsas taught students techniques on evading dynamic-analysis environments (see Figure 5). After the tutorial, students were given a custom app with malicious functionality. The challenge was to hide this functionality by patching the bytecode of the app with a simple VM-evasion technique. At the end, students have to submit both the original and the repackaged application to an online analysis service (e.g., Andrubis) in order to draw conclusions.

Towards the end of the school, a malware competition was held for the participants. Students were divided in four teams. For each team, there was a team leader with experienced skills in Android/Java coding. A benign application with many permissions was given to the teams. The first challenge for the teams, was to hide a malicious functionality of their choice inside the application. All teams had to complete the challenge and put the malicious application in a USB stick within a specific time frame. After that, each



Figure 3: Tutors helping students during the hands-on exercises.

team exchanged applications with another team. By using reverse engineering techniques, teams had to identify the malicious functionality of the given applications and infer what the other team had done. At the end, each team leader presented the findings of his team and the committee announced the winner. The criteria were based on the creativity of the teams and the sophistication of techniques used for hiding the malicious functionality inside the applications.

### 5.3.2 Evaluation of the Summer School

After the end of the school we asked the students to fill an online evaluation survey to get a more accurate picture of what they thought about the event. Overall, the impression we got was that students liked the Summer School.

So far<sup>2</sup>, **the students have rated the Summer School with an average of 4.27/5**. The lowest score, given by one students, was 3. By the given ratings (on individual days), students seemed to appreciate most the advanced topics of the second day. The second day had a malware competition before the closing of the summer school. All participants really enjoyed the challenge of the competition and were excitedly awaiting the results. The average score for the second day was 4.5/5. For the first day the average score was 4/5, with 6 people giving it a mark of 3.

---

<sup>2</sup>At the time of writing of this report we haven't yet received responses from all students.





Figure 4: Victor Van Der Veen presenting the TraceDroid platform.

## 6 Other Dissemination Activities

### 6.1 Cooperation with other research groups and institutions

- **Cooperation with the European Internet Foundation:**

Stefano Zanero participated as a guest speaker and discussant in a workshop organized at the European Parliament by the European Internet Foundation<sup>3</sup> (EIF).

The mission of the EIF is to help provide European political leadership for the development of European multilateral public policies responsive to the political, economic and social challenges of the world-wide digital revolution.

The workshop was organized to kickstart the “Digital World in 2030” report preparation. We contributed to the Socio-political Dimension Workshop, bringing to the table insights from the SysSec roadmap and Red Book.

URL: <http://bit.ly/ZvbwED>

- **Ali Rezaki (TUBITAK-BILGEM - SysSec member) elected as the Vice-Chair of the WPISP bureau for 2014:**

OECD, Directorate for Science, Technology and Industry (DSTI), Working Party on Information Security and Privacy (WPISP) looks at cyber-

---

<sup>3</sup>European Internet Foundation: <http://www.eifonline.org/>

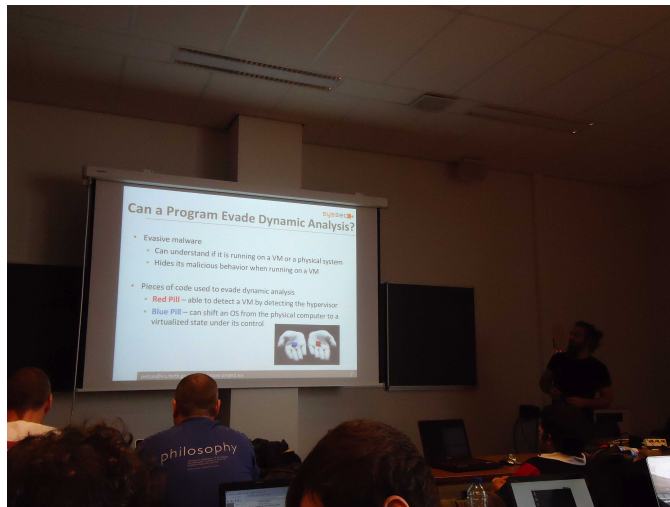


Figure 5: Thanasis Petsas is teaching techniques on how to evade dynamic-analysis on Android platform.

security and privacy matters from an economic and social perspective<sup>4</sup>.

The WPISP produces public policy strategies and recommendations on security and privacy for the digital economy. It comprises of OECD member country delegations as well as representatives from the business, civil society and Internet technical communities. The WPISP is supported by the OECD Secretariat and a bureau elected by the Working Party each year. Ali Rezaki has been elected as the Vice-Chair of the WPISP bureau for 2014. From the beginning of 2014 the name for WPISP has been changed as the Working Party on Security and Privacy in the Digital Economy (WPSPDE).

### 6.2 Co-organization and support of events

The SysSec consortium actively supported several key European events and conferences. In particular, this year we supported the **7<sup>th</sup> European Workshop on Systems Security**.

It was held on April 13, 2014 in Amsterdam, The Netherlands. The workshop (which is associated with the Annual ACM SIGOPS EuroSys conference<sup>5</sup>) focuses in discussion of novel, practical, systems-oriented work.

It is the **third consecutive year** that SysSec is contributing to the organization of the workshop. EuroSec 2014 is co-chaired by Davide Balzarotti

<sup>4</sup><http://www.oecd.org/sti/whatistheoecdworkingpartyoninformationsecurityandprivacywpisp.htm>

<sup>5</sup><http://eurosys2014.vu.nl/>



## 6.2 Co-organization and support of events



Figure 6: CTF competition

**EUROSEC 2014**  
13 April 2014, Amsterdam, The Netherlands

**About EuroSec 2014**  
The seventh European Workshop on Systems Security aims to bring together researchers, practitioners, system administrators, system programmers, and others interested in the latest advances in the security of computer systems and networks. The objective of the workshop is to discuss novel, practical, systems-oriented work.

**Topics of Interest**

- New attacks, evasion techniques, and defenses.
- Operating system security.
- Mobile systems security.
- Malicious code analysis and detection.
- Web security.
- Network security.
- Reverse engineering and binary analysis.
- Identity management and anonymity.
- Hardware and physical security.
- Virtual machines and hypervisors.
- Measuring security.
- Trusted computing and its applications.
- System security aspects of privacy.
- Identity management and anonymity.
- Systems-based forensics.
- Systems work on fighting spam/phishing.
- Automated techniques for vulnerability analysis and discovery.
- Embedded system security.
- Security of critical infrastructures.

**A workshop of**  
 **EuroSys**  
ACM SIGOPS in Europe

**Organisation**  
The workshop is co-chaired by  
• **Davide Balzarotti**  
(EURECOM)  
• **Juan Caballero**  
(IMDEA Software Institute)

**Important Dates**  
**Submissions:** February 15, 2014  
**Acceptance by:** March 5, 2014  
**Final papers:** March 28, 2014

**Twitter updates**  
Follow @EuroSecWorkshop and @syssecproject on Twitter to receive direct updates about the workshop.

<http://bit.ly/eurosec14>  
[eurosec14@syssec-project.eu](mailto:eurosec14@syssec-project.eu)

Figure 7: EuroSec 2014 promotional poster.

(Eurecom - SysSec member) and Juan Caballero (IMDEA Software Institute - SysSec Associate Member).

SysSec provided hosting and support for the workshop website and paper submission facility. Additionally, the communication channels of the project (*SysSec Constituency* mailing list and Twitter community) have been used to promote the event and all partners were encouraged to submit their work to the venue.

The event was held on April 13, 2014 in Amsterdam. During the workshop, two invited talks were given by Ahmad-Reza Sadeghi (Technische Universität Darmstadt) and Angelo Dell'Aera (Honeynet Project). Overall, the feedback received from the attendees was positive. After the end of the workshop the chairs acknowledged and thanked SysSec members for their continued support to the workshop.

URL: <http://www.syssec-project.eu/eurosec-2014/>

### 6.3 Presence at international events

The SysSec consortium was invited to present in multiple large international events, among which:

- **Participation to the High level conference on the EU Cybersecurity Strategy:**

Antonis Krithinakis, Meltini Christodoulaki and Magnus Almgren participated on behalf of the project to the High level conference on the EU Cybersecurity Strategy, held in Brussels on 28th February, 2014. The conference discussed the progress achieved in the year after the publication of the EU Cybersecurity Strategy.

The event took place in the main hall of the Charlemagne building where a large foyer at the entrance was used for stands and posters. We organized a booth to present the progress and outcomes of the SysSec project.

During the conference, the participants had the opportunity to learn about SysSec research activities and practice on how to use our AndroTotal web service for evaluating antivirus solutions in Android Market. Additionally, hard copies of the Red Book were distributed at the conference while we also gave the opportunity to anyone interested to provide a postal address for receiving a copy of the book in the future.

- **SysSec mention at the Cyberspace Security - High-level Visit of Key Opinion Leaders:**

In the period 7-9 July, 2014, Dr. Zlatogor Minchev was invited to take part in 'Cyberspace Security - High-level Visit of Key Opinion Leaders' as Bulgarian representative in the international delegation. The

## 6.3 Presence at international events



Figure 8: The SysSec booth at the High level conference on the EU Cybersecurity Strategy.

[www.syssec-project.eu](http://www.syssec-project.eu)

European Commission – Seventh Framework Programme  
Information & Communication Technologies – Trustworthy ICT

# syssec

**Managing Threats and Vulnerabilities in the Future Internet**

SysSec aims to:

- Consolidate the European systems security research community
- Enable the creation of effective synergies
- Promote cybersecurity education in Europe
- Engage a think-tank to identify emerging cyberthreats
- Create a research roadmap in systems security

| Our Community   | Research and Education  |
|---|---|
| <ul style="list-style-type: none"><li>• Three Working Groups with more than 50 renowned experts</li><li>• Constituency of over 300 members from more than 25 countries</li><li>• Mobility through researcher exchanges: Up to four months/€3600</li><li>• Quick and easy application: <a href="http://syssec-project.eu/ask">http://syssec-project.eu/ask</a></li></ul> | <ul style="list-style-type: none"><li>• More than 80 peer-reviewed publications</li><li>• Reference courses and teaching material on systems security</li><li>• A highly successful summer school on malicious software analysis: <a href="http://syssec-project.eu/ss2012">http://syssec-project.eu/ss2012</a></li></ul> |

**Associate Members**

- Currently listing over 50 members from around the world
- Early access to course material
- Associate Members are eligible to host SysSec researcher exchanges
- Apply now! <http://syssec-project.eu/join>

**The SysSec Red Book**

A roadmap in the area of systems security, as prepared by the SysSec consortium and its constituency

To prepare this roadmap, a task force of young researchers with previous track record in the area was assembled and collaborated with the senior researchers of SysSec. Additionally, the SysSec community was consulted to provide input on the contents of the roadmap. The resulting roadmap is the culmination of the first three years of SysSec efforts.

Available online: [www.red-book.eu](http://www.red-book.eu)

**Members of the SysSec Consortium**

|   |   |
|---|---|
| <br>Fondazione per la Ricerca e la Tecnologia (FRT)<br>Istituto di Ricerca e Tecnologia (IRT) | <br>Institute of Information and Communication Technologies<br>Bulgarian Academy of Sciences (ICT-BAS)                                  |
| <br>Politecnico di Milano   | <br>Vrije Universiteit Amsterdam  |
| <br>E.ON Energy Research Center   | <br>National Research Institute of Electronics and Computer Science<br>Scientific and Technological Research Council of Turkey (ICTEAS) |

With the financial support of the European Union Seventh Framework Programme (FP7-2007-2013), Grant Agreement No. 232087

Figure 9: SysSec poster.

event was organized by NATO Public Diplomacy Division, Engagement Section and includes eight nations' key experts' visits to NATO HQs, Brussels and SHAPE, Mons, both in Belgium, together with NATO Cyberspace Security Centre of Excellence in Tallinn, Estonia. During the event, Dr. Minchev shared his experience in the field of cyber security, accentuating on computer assisted strategic concepts validation and human factor analysis role in the cyber space. The visits were in the context of the Alliance cyber space security and defence progressive plans and the upcoming NATO Summit in Wales for September, 2014.

### 6.4 Presence in the media

SysSec appeared in the following traditional and online media.

- January 2014 issue of ERCIM News had a special theme on Smart Energy Systems (see Figure 10). SysSec contributed to the edition with an article titled *"Cybersecurity in the Smart Grid"* authored by Magnus Almgren (Chalmers), Davide Balzarotti (Eurécom), Marina Papatriantafilou (Chalmers) and Valentin Tudor (Chalmers). The article argues on the importance of transferring knowledge from the domain of ICT security to the domain of Smart Grids. It points that efforts like SysSec and CRISALIS<sup>6</sup> could play an important role in developing cross-domain expertise in ICT security and power engineering.

URL: <http://ercim-news.ercim.eu/en92/special/cybersecurity-in-the-smart-grid>

- July 2014 issue of ERCIM News had a special theme on Smart Cities (see Figure 10). SysSec contributed to the edition with an article titled *"When Smart Cities meet Big Data"* authored by Vincenzo Gulisano (Chalmers), Magnus Almgren (Chalmers) and Marina Papatriantafilou (Chalmers).

The article argues that sharing information is a key enabler in the transition of a city becoming smart. Information, generated by the ICT backbone of a city, and maintained by distinct public and private entities, comes with processing challenges that must be addressed in order to increase citizens' quality of life and make their cities sustainable.

The article points that efforts like SysSec and CRISALIS<sup>7</sup> investigate such challenges from a security perspective in order to protect and enhance smart cities' sensitive infrastructures.

URL: <http://ercim-news.ercim.eu/en98/special/when-smart-cities-meet-big-data>

---

<sup>6</sup><http://www.crisalis-project.eu/>

<sup>7</sup><http://www.crisalis-project.eu/>

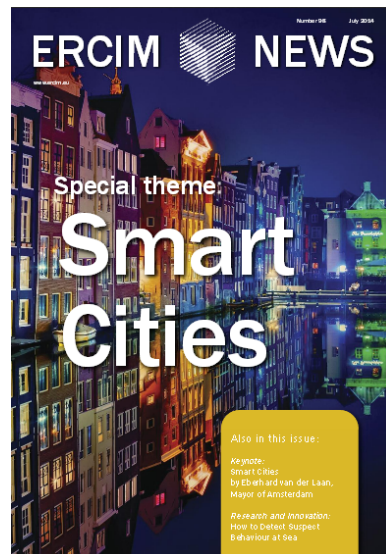


Figure 10: ERCIM News 98 July 2014, Special theme: Smart Cities

- 06/09/2013. **Erland Jonsson (Chalmers)** had an interview on [Swedish national radio](#), where he commented on the leaks about NSA. You can listen to the interview or read the transcript [online](#).
- 12/09/2013. **Herbert Bos (VU Amsterdam)** had an Interview on [Business News Radio \(BNR\)](#) about **hackers**. You can listen to the interview [online](#).
- 21/09/2013. **Herbert Bos (VU Amsterdam)** had an interview in [NRC.next](#), a Dutch language newspaper.
- 18/10/2013. **Herbert Bos (VU Amsterdam)** had a long interview on national radio [Hoe? Zo! Radio \(NTR\)](#), in which he commented about **cybercrime** and **cybercriminals**. You can listen to the interview or read the transcript [online](#).
- **SysSec mention at the PanEuropa International Conference:**  
The efforts of SysSec consortium were also noted by *Computerworld - Bulgaria* concerning NATO, EU and collective cyberdefence problems posted by Dr. Zlatogor Minchev and marking the *Red Book* publication trends together with national cybersecurity strategy preparation and regional cooperation efforts. The discussion was organized from PanEuropa - Bulgaria during the international conference “Smart Defence, Cybersecurity and Open Doors Policy: The New Euro-Atlantic Security Synergies” welcomed by EC vice-president Neelie KROES.



## 7 Community-building activities

### 7.1 SysSec Constituency

During the final year, we kept expanding our dissemination base (which we call the SysSec “Constituency”). This is not just a mailing list, but a list of people with which we have direct connections, and who specifically wished to be informed of our activities.

At the end of this reporting period, we had a total of **240 people subscribed**<sup>8</sup>.

So far, the dissemination list has a pivotal role in the promotion of both SysSec scientific output as well as the promotion of events and activities. Some of the occasions where we used the list include, the kickstarting our associate members program (see Section 7.2), the promotion of our workshops and hosted events and most important the announcement of the SysSec Red Book.

### 7.2 SysSec Associate Members

At the end of the second year of SysSec, we had announced our *Associate Members* (AMs) initiative with the goal to strengthen and expand our community. We saw this initiative as an opportunity which would allow SysSec to evolve from a community of loosely related members to a *scientific association of affiliated members*.

Applications for new *SysSec Associate Members* were received through our website. In order to strengthen our ties with the Associate Members and encourage people to apply, we came up with several incentives for them:

- Being eligible for SysSec scholarships.
- Access to the SysSec course repository and will be able to contribute course material as well.
- First to receive hard copies of the SysSec Red Book.
- Invitations to online consultations related to SysSec roadmapping efforts.
- Invitations to meetings (such as workshops and summer schools) and the travel expenses of some of them may be covered by the project.

Applications to become an AM were evaluated on a bimonthly basis. After the final round of evaluation, **our AM community currently lists 85**

---

<sup>8</sup>This figure excludes the SysSec partners and Working Group members.

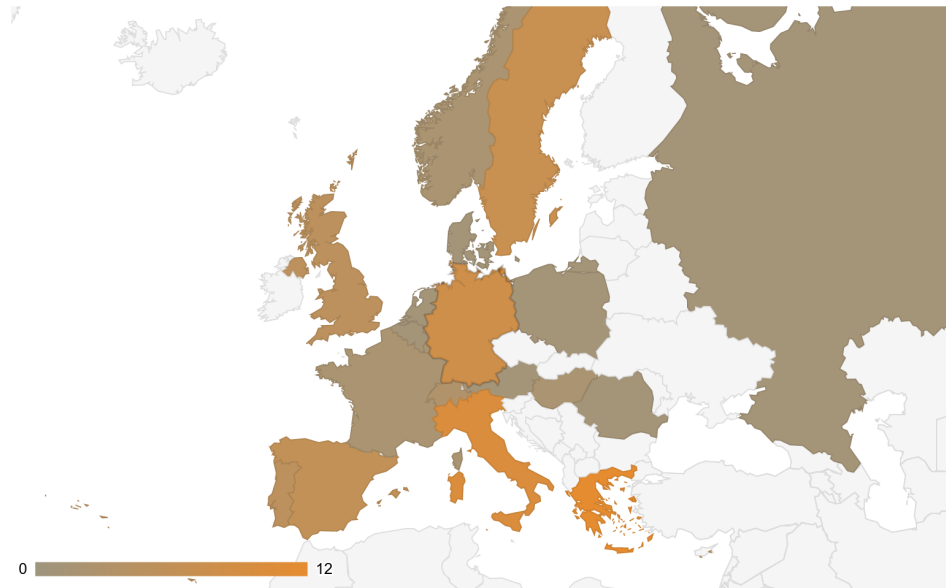


Figure 11: *SysSec Associate Members* across Europe. We have covered the major part of the continent and we hope to be able to expand further in the next year.

**members** from around the world. Figure 11 shows the number of members we have across Europe<sup>9</sup>.

## 8 SysSec website and social media

### 8.1 Website management

We kept updating the project website, adding also event-specific websites for events we supported such as [EuroSec 2014](#) and [EuroSec 2015](#). One of our contributions was the design, hosting and support of their websites. The websites are hosted under the main SysSec websites, but use a different theme.

Responding to comments received during conferences, we decided we should make our website more friendly to mobile devices such as tablets and phones. Towards this end we replaced the [960.gs](#) framework which we had initially used with the [Bootstrap](#) framework. Both frameworks layout the website content on a *grid*, so transition was straightforward. However Bootstrap comes loaded with a lot more components for common use cases.

---

<sup>9</sup>A world map which also includes AMs from outside Europe is featured on our website: <http://www.syssec-project.eu/community/members/>.

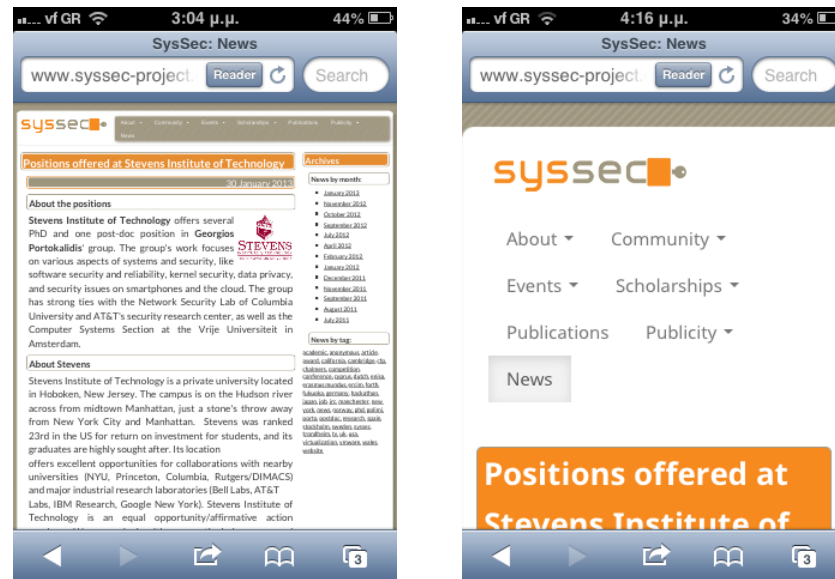


Figure 12: Default iPhone view of the SysSec website news section when using the *960.gs* (left) and *Bootstrap* (right) frameworks. We can see that with Bootstrap the contents are automatically scaled to a size comfortable for reading without the user having to zoom-in manually.

The most important of these is the *responsive layout* component, which automatically reflows the page contents to fit the display of the visitor's device (see Figure 12).

## 8.2 Visitors & Trends

The visits to the SysSec website per month can be seen in Figure 13. We can see that a total of 44,713 visits were recorded for the whole duration of the project. This means that we had an approximate of *more than 28 visits per day*.

The pages viewed by the visitors of our website appear in Figure 14. Naturally enough, the front page of the website dominate the page views. It also seems that there is a considerable interest in our *Publications* and *Presentations* section. These pages were the most frequently updated, so it was expected to rank high in views.

## 8.3 Documents downloads

Perhaps more important than the statistics about the visits to the pages of our website is how much material was downloaded from it. This is because most of the output of the project is published online as pdf documents and not html pages.



### 8.3 Documents downloads

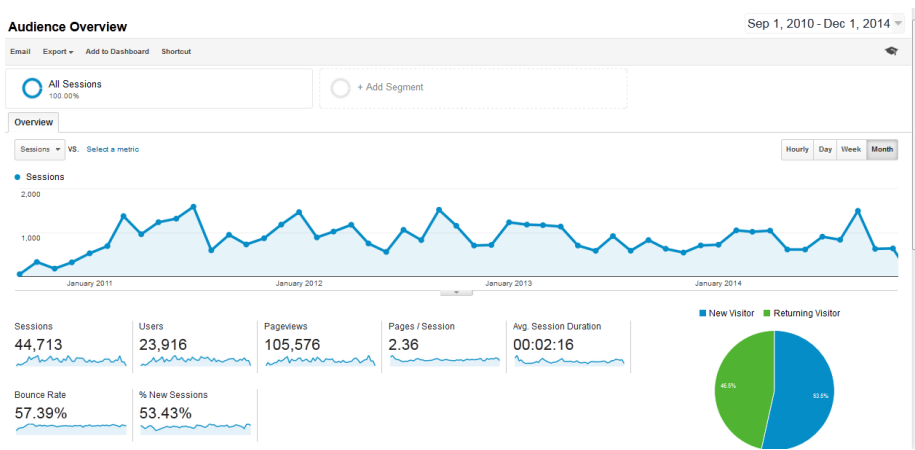


Figure 13: Visits to the SysSec website.

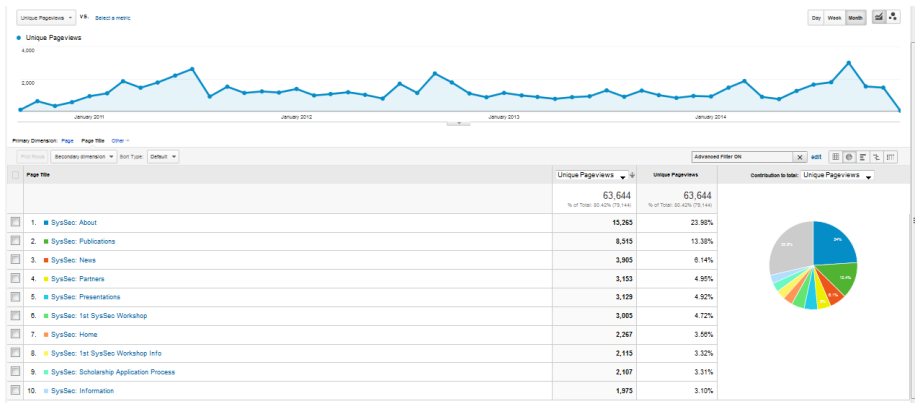


Figure 14: Unique pageviews of the website content.

The first year of the project a total of 7,937 copies of documents were downloaded from the SysSec website, out of the 116 published documents.

The second year of the project a total of 18,324 copies of documents were downloaded from the SysSec website, out of a total of 200 published documents. This means that the number of downloads increased by 130% compared to the first project year or that each unique visitor downloaded approximately 3 documents.

The third year of the project a total of 42,708 copies of documents were downloaded from the SysSec website, out of a total of 265 published documents. This represents more than twice (133%) the number of downloads we had in the second year of the project and three times the number of downloads we had in the first year.

The fourth year of the project and the three months of the project extension a total of 100,547 copies of documents were downloaded from the SysSec website, out of a total of 406 published documents. The number of downloads is increased by 135% compared to the third year.

### 8.3.1 Downloads per document category

To gain some insight on the preferences of our website visitors we categorized the documents we made available to the following categories:

- *Publications:* SysSec sponsored papers published by the consortium in peer reviewed conferences and journals.
- *Presentations:* Presentations made by the consortium in events related to the project.
- *Deliverables:* The deliverables produced by the project, as outlined in the description of work document.
- *Other:* Everything else. This includes material from hosted events (EuroSec, DIMVA 2012, etc.), clippings from SysSec related articles in magazines, and papers, presentations as well as organization information from events organized by SysSec. This includes the SysSec summer schools and workshops.

Figure 15 shows how many documents were downloaded from each category. We can see that the publications are dominant, which is indicative of the quality research conducted by the SysSec consortium.

In deliverable D2.2<sup>10</sup> we provide more details on document downloads per category we had throughout the duration of the project and we present web statistics for the RedBook website and the number of downloads of the book.

---

<sup>10</sup><http://syssec-project.eu/d2.2>

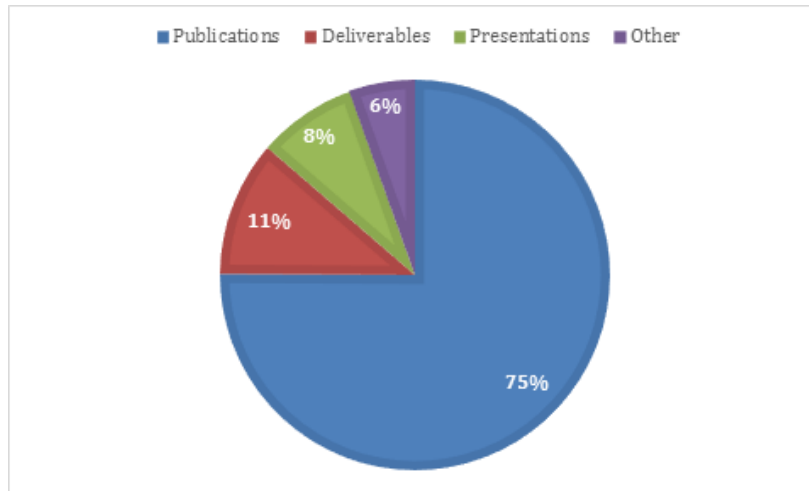


Figure 15: Downloads per document category.

#### 8.4 Twitter and Facebook

We proceeded to create a social circle around our project and its web page, by using both a Facebook page and a Twitter account<sup>11</sup> linked to each other. Both were intensively used to disseminate events participations, published papers and news about SysSec. The SysSec Facebook page has 270 followers, whereas the Twitter feed is followed by 462 followers.

The number of followers indicates a considerable interest for SysSec from the community, as we didn't push to gather followers, but rather let the social network effect build a community. We pushed 274 *tweets* through these channels.

<sup>11</sup> <http://twitter.com/#!/syssecproject>