Proceedings

MADWeb 2021

Workshop on
Measurements, Attacks, and Defenses
for the Web

February 25, 2021
Virtual

Published by the

Internet Society
11710 Plaza America Drive
Suite 400
Reston, VA 20190

Address your correspondence to: NDSS Program Manager, Internet Society, 11710 Plaza America Drive, Suite 400, Reston, VA 20190 USA, tel. +1 703 439 2120, fax +1 703 326 9881, ndss@elists.isoc.org.

The papers included here comprise the proceedings of the meeting mentioned on the cover and title page. They reflect the authors' opinions and, in the interest of timely dissemination, are published as presented and without change. Their inclusion in this publication does not necessarily constitute endorsement by the editors or the Internet Society.

ISBN Number (Digital Format) 1-891562-67-3

Additional copies may be ordered from:

Internet Society
11710 Plaza America Drive
Suite 400
Reston, VA 20190
tel +1 703.439.2120
fax +1 703.326.9881
http://www.internetsociety.org

Proceedings of MADWeb 2021 – Workshop on Measurements, Attacks, and Defenses for the Web

Table of Contents

Program Committee Chairs' Message

The web connects billions of devices, running a plethora of clients and serving billions of users every single day. To cope with this widespread adoption, the web constantly changes with a stream of new technologies to develop web applications and ever-more complicated web browsers to render them. These rapid changes of the web's ecosystem are not always studied from a security perspective, resulting in new attack vectors that were never observed before.

The Measurements, Attack, and Defenses for the Web (MADWeb) workshop aims to attract researchers that work on the intersection of browser evolution, web security, and large-scale measurements. Our goal is to create and sustain a new venue for discussing the rapid changes to web technologies from a security perspective, how we can protect users, and how we can make future browsers more secure without hindering the evolution of the web. To this end, we invited researchers to contribute to the third Workshop on MADWeb, co-located with NDSS Symposium 2021. This year the workshop received 25 submissions (56% more submissions than last year), which indicates the excellent growth and confirms our intuition that the research community wants a security and privacy workshop dedicated to the web. More specifically:

- 25 papers were submitted to the workshop, out of which the Program Committee selected 9 (36% acceptance rate).
- 33 Program Committee members supported the reviewing process, including prominent representatives of academic and industrial research.
- 1 paper was selected for the best paper award based on its outstanding review scores, and 2 additional papers were selected for the best paper runner-up award.
- One author of each submitted paper was offered financial support to cover the cost of workshop registration.
- 2 invited talks were scheduled (from academia and from industry) on the crucial topics of browser security and measuring and defending against phishing

The wide range of topics covered by the accepted papers is remarkable, as it indeed covers all the three thrusts of the workshop, i.e., measurements, attacks, and defenses. In fact, we see that in addition to securing browsers, researchers focused on core infrastructure security (e.g., encrypted DNS), and on studying various new attacks, including cookie exfiltration and malicious content in social media platforms. We had a large number of attendees (more than 50 present online at each talk and Q/A session) and a very productive discussion at the workshop, and we expect that the number and diversity of web-related research topics will keep growing in future editions of MADWeb.

MADWeb's paper awards and financial support for registrations were possible thanks to the sponsorship and generous support by Palo Alto Networks, Inc.

Oleksii Starov and Roberto Perdisci
Program Committee Chairs, MADWeb 2021

Organizing Committee

Program Committee Chairs

Oleksii Starov, *Palo Alto Networks*
Roberto Perdisci, *University of Georgia*

Program Committee

Adam Doupé, *Arizona State University*
Adam Oest, *PayPal*
Amin Kharraz, *Florida International University*
Antoine Vastel, *DataDome*
Ben Stock, *CISPA Helmholtz Center*
Billy Melicher, *Palo Alto Networks*
Christo Wilson, *Northeastern University*
Cristian-Alexandru Staicu, *CISPA Helmholtz Center*
Gianluca Stringhini, *Boston University*
Gunes Acar, *KU Leuven*
Jason Polakis, *University of Illinois at Chicago*
Konrad Rieck, *TU Braunschweig*
Kyu Hyung Lee, *University of Georgia*
Leyla Bilge, *NortonLifeLock*
Louis DeKoven, *Facebook*
Luca Invernizzi, *Google*
Lukas Weichselbaum, *Google*
Nataliia Bielova, *INRIA*
Octavian Suciu, *University of Maryland, College Park*
Peter Snyder, *Brave*
Phani Vadrevu, *University of New Orleans*
Sajjad "JJ" Arshad, *Google*
Sebastian Lekies, *Google*
Steven Englehardt, *Mozilla*
Tamara Rezk, *INRIA*
Thomas Vissers, *Cloudflare*
Tom Van Goethem, *KU Leuven*
Walter Rudametkin, *Polytech*
Lill Weihang Wang, *University at Buffalo*
Yinzhi Cao, *Johns Hopkins University*
Yuchen Zhou, *Facebook*
Zachary Weinberg, *University of Massachusetts Amherst*
Zubair Shafiq, *University of Iowa*

Steering Committee

Alexandros Kapravelos, *North Carolina State University*
Nick Nikiforakis, *Stony Brook University*