Proceedings

2023

Network and Distributed System Security Symposium

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Network and Distributed System Security Symposium

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Message from the General Chairs

Welcome to the 2023 Network and Distributed System Security (NDSS) Symposium! We're excited that this is our 30-year anniversary, and that you are here to celebrate with us!

Fun fact: if you go to the NDSS website, you will see that the first proceedings posted are from 1993. The astute among us will realize that this means that 2023 should be the 31st year, but it's not so! In 1993, NDSS was actually a workshop that was co-hosted by the Internet Society (ISOC) and Lawrence Livermore National Laboratory. The workshop was so successful, that ISOC agreed to host it the following year, as a symposium instead of a workshop, and they have been hosting it ever since!

NDSS has grown in the past 30 years! In 1994, there were 15 papers, three panels and one guest speaker. This year, there are 94 papers and two keynote speakers, along with six co-hosted workshops and two co-located symposia, a special session at NDSS that will give the highlights from each of the co-located events, birds-of-a-feather sessions, a poster session, and a special session celebrating 30 years.

Of course, a program like this could not be put together without the tireless efforts from a large number of volunteers, and they all deserve a huge amount of thanks. First, we'd like to thank our Program Committee Co-Chairs, Wenyuan Xu and Mathias Payer, who have put together a fantastic program, including organizing our first ever workshop highlights session so that the NDSS community who were unable to attend the co-located events can still benefit from learning what was discussed at them.

Similar to previous years, NDSS 2023 had two submission phases, and thanks goes to the co-chairs, the 112 program committee members, and the external reviewers for their work in reviewing paper submissions, shepherding them through major and minor revisions, and selecting the best papers to be presented. A special thanks also goes to David Balenson as publications chair for collecting the camera-ready papers and ensuring they are published.

We would like to also thank Ben Stock and Xiajing Liao for selecting a dynamic set of associated workshops and symposia. This year we are excited to host:

1) Symposium on Vehicle Security and Privacy (VehicleSec);
2) Workshop on Binary Analysis Research (BAR);
3) Learning from Authoritative Security Experiment Results (LASER) Workshop;
4) Workshop on Measurements, Attacks, and Defenses for the Web (MADWeb);
5) Workshop on Ethics in Computer Security (Ethics);
6) Workshop on Security of Space and Satellite Systems (SpaceSec);
7) Workshop on Security Operation Center Operations and Construction (WOSOC); and
8) Usable Security and Privacy (USEC) Symposium.

Three of the workshops continue from last year along with one symposium. There are three entirely new workshops this year, and we're thrilled to welcome VehicleSec back to NDSS as a symposium rather than a workshop (previously named AutoSec). We would also like to thank VehicleSec for co-sponsoring the NDSS Welcome Reception.

There are many other people who have helped make NDSS 2023 a success, and we would like to thank Alexandra Dmitrienko and Tiffany Bao for putting together a wonderful poster session this year, including organizing the best poster awards. We would also like to thank Pedro Moreno-Sanchez and his team for reviewing the student grant applications resulting in support for 18 students, Brendan Saltaformaggio and Ramjita Pai Kasturi for publicity, and Tom Hutton as local arrangements chair. And the Steering Committee deserves thanks for their active participation and wise advice.

We also want to provide a special thank you to Ahmad-Reza Sadeghi and Ben Stock for putting together the 30-year anniversary celebration session, including the fun video that gives us a blast from the past! Another special thank you to Mathias Payer for providing an overview of the previous test-of-time winners to highlight the impact that NDSS has had on the security community. And thanks to CISPA for supporting the Wednesday night anniversary celebration!

NDSS is possible in large part thanks to our generous sponsors, and we'd like to thank (in alphabetical order) sponsorship from the following companies (including organizations that sponsored VehicleSec): ASU Global Security Initiative, BlockSec, Check Point, Cybertruck Challenge, ETAS, Futurewei Technologies, GM, Google, Huawei, IBM, Meta, National Science Foundation, Netflix, Palo Alto Networks, Qualcomm, TikTok, and Zoox.

NDSS would not happen if it were not for the incredible support from Karen O'Donoghue and her team – thank you!! And thank you to the Internet Society for their continued support of NDSS for the past 30 years, and to the Association Management Solutions (AMS) staff.

Finally, thank you to all of you!! Your participation in NDSS is the reason we exist, and we would love to thank you for 30 years of support building a warm community around this symposium. We hope that you enjoy NDSS 2023 and our anniversary celebrations!

Carrie Gates and Cristina Nita-Rotaru
General Chairs, NDSS 2023

Message from the Program Committee Co-Chairs

It is our great pleasure to present to you the technical program of the 2023 Network and Distributed System Security (NDSS) symposium, held as a hybrid event between February 28 and March 3, 2023. For the past 30 years, NDSS has established itself as one of the top conferences in systems security and network security. Papers published at NDSS have made a significant impact on research and practice, as exemplified by the awardees of the NDSS Test-of-Time Award. Our goal continues to be “impact”, especially in the form of novel and practical solutions and techniques in cybersecurity. We hope that the papers in this year’s program reflect the same strong potential in securing real-world networks and systems.

This year we received a total of 574 complete submissions (i.e., not counting papers that clearly violated the submission guidelines). Submissions were evaluated on the basis of their technical quality, novelty, and significance. Multiple rounds of reviewing culminated in two online discussion periods. At the end of the review process, 94 papers (16.4% acceptance rate) were selected to appear in the program. We strove to make the review process a competitive but constructive one. Program Committee (PC) members were regularly reminded to identify positive points in the submission and provide concrete suggestions to improve each paper. Each paper received two initial reviews and, if either review identified positive feedback it advanced to the second round for another set of reviews. Later for each author rebuttal, which was solicited after all reviews were in, we required the corresponding reviews be updated to respond to the rebuttal, to help improve the quality, timeliness, and responsiveness of the review process.

Organizing a conference as large as NDSS is a substantial endeavor, and we would like to extend our sincere thanks to everyone who contributed their time and effort. We would like to specifically thank a few individuals who made particular contributions to NDSS 2023. General Chair Carrie Gates and Cristina Nita-Rotaru oversaw the conference and worked closely with us for Keynote Speaker. Karen O'Donoghue served as a critical interface between the Program Co-Chairs, the Organizing Committee, and ISOC. Publicity Co-Chairs Brendan Saltaformaggio and Ranjita Pai Kasturi worked seamlessly with us to solicit submissions and promote the conference. Publications Chair David Balenson took excellent care of the proceedings production matters. Our special thanks also go to Chen Yan from Zhejiang University for their continuous effort in maintaining the submission system, supporting the PC Co-Chairs during the reviewing process, and planning the event schedule.

Last but not least, we would like to thank our PC members and the external reviewers. The PC members have contributed significant time and effort to the creation of the technical program. It has been our privilege working with them. Finally, we thank all authors who submitted to NDSS 2023 and all attendees who are virtually joining us at NDSS 2023, without whom NDSS would not be possible. Enjoy the conference!

Wenyuan Xu and Mathias Payer
Program Committee Co-Chairs, NDSS 2023

Message from the Internet Society

The Internet Society is proud to host the 30th edition of the Network and Distributed System Security (NDSS) Symposium, one of the world's premier conferences for computer and network security research. Our involvement with NDSS spans this entire period and is a testament to the recognition and support this event receives from the research community both in academia and industry.

A key focus of the Internet Society is improving the security and trustworthiness of the global open Internet. NDSS 2023 brings together leading academics, industry researchers, students, and security practitioners to discuss high-quality peer-reviewed research and to exchange ideas. There is also a strong focus on student participation with the aim of fostering the next generation of leaders in security and privacy.

The Internet Society is committed to using the Internet to improve access to research and to exchange ideas. NDSS 2023 is the second year that we're supporting a hybrid event which is being held over five full days and includes a record eight co-located events including two symposia (VehicleSec and USEC), and six workshops (WOSOC, EthiCS, SpaceSec, MADWeb, LASER and BAR), 94 paper presentations, two keynotes, and 34 posters. We're also very pleased to welcome keynote speakers Richard Ford (Praetorian) who is discussing ChatGPT and what this means for machine learning for cybersecurity and privacy, and Nina Taft (Google) who is discussing the challenges developers face with respect to continually evolving privacy laws, policies, and user preferences.

Of course, NDSS 2023 relies very heavily on volunteers from the community to help put together this high-quality program. We are grateful for the hard work undertaken by General Co-Chairs Carrie Gates and Cristina Nita-Rotaru, Program Committee Co-Chairs Wenyuan Xu and Mathias Payer, along with the other members of the Organizing and Program Committees who have invested countless hours to review papers and posters, organize the co-located events, publicize the event, and publish the papers.

Finally, we must thank the sponsors without whom this event would not be possible. This includes our Gold Sponsors Google, the National Science Foundation and TikTok; our T-shirt sponsor BlockSec; our Silver Sponsors Check Point, Futurewei Technologies, Huawei, IBM, Meta, Netflix and Palo Alto Networks; our Lanyard Sponsor Qualcomm; our Reception Sponsor ASU Global Security Initiative; and our VehicleSec Symposium Sponsors ASU Global Security Initiative, Cybertruck Challenge, ETAS, General Motors, the National Science Foundation, Qualcomm and Zoox. We continue to be grateful for the support provided by San Diego Supercomputing Center and USENIX.

On behalf of the Internet Society, I welcome you to NDSS 2023 and hope you have an enjoyable and productive week.

Andrew Sullivan
CEO, Internet Society

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