Chenkai (Nicholas) Wang

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Education

2021- **M.S.** in Computer Science, UIUC

2017-2021 **B.S.** in Geography & Geographic Information Science, UIUC
B.S. Minor in Computer Science, UIUC

Research Interests

Computer Security, Networking, Embedded Systems, Operating Systems

Publications

2022 **Chenkai Wang**, Gang Wang, "Revisiting Email Forwarding Security under the Authenticated Received Chain Protocol", *Proceedings of The ACM Web Conference (WWW'22)*

Appointments

2023.1- Research Assistant in Computer Science, UIUC

2022.1-2022.12 Teaching Assistant: CS461 Computer Security I, UIUC

2020-2021 Undergrad Research Assistant, UIUC

2018 Course Assistant: CS125 Intro to Computer Sci., UIUC

2016-2019 Embbeded Firmware Developer, Hefei Tuocheng Mould Technology Co.,Ltd
** Full-time in every May to August from 2016 to 2019*

Experiences

Authenticated-Received Chain & Email Forwarding Security

I led this project cooperating with Dr. Gang Wang from September 2020 to October 2021. Results have been published in *Proceedings of The ACM Web Conference (WWW'22)*. On August 2023, **Mozilla Core Services** bug bounty program awarded $1,000 USD for the Firefox Relay vulnerability.

- Analyzed Email security issues with Email fowarding as the entry point
- Implemented Authenticated-Received Chain and experiment utilities
- Performed real-world controlled experiements against multiple major Email service providers and open-source implementations
- Discovered vulnerabilities of real-world services by Apple, Mozilla and Zoho, disclosed and got responses

High Trust Patient Outreach with OSF Healthcare

I am leading this ongoing project starting Feburary 2022 and did majority of the work, collaborated with Jonathan Handler, Nicholas Heuermann, Roopa Foulger from OSF Healthcare and Dr. Gang Wang.

- Explore options that provides usable solution that adds authenticity to exisiting text messaging systems to prevent spoofing and scams
- Develop a few schemes that potentially provides such capability
- Design user studies to testify

Operation BGP Autonomous Systems AS142130, AS142282

I am the sole operator of AS142130 and AS142282 network, which I used for my homelab network and provide myself IPv6 access, as well as running experimental technologies.

- Design, implement and deploy the tunnal-based, software-defined overlay network
- Appear in multiple Internet Exchanges and private peering sites
- Provide IPv6 transit to one downstream network
- Stable operation since 2020

b23.wtf Tracking-Removal Service

I am the sole author and maintainer of this project. It removes tracking parameters from `https://b23.tv/[location]` short URLs generated by bilibili apps.

- Linux single-threaded epoll() HTTP server with 0 dependencies in C
- HTTP query module invoked with pthread multithreading
- In December 2022, 90k total requests and 3k unique visitors over previous 30 days, statistics by Cloudflare

Project V (formerly V2Ray)

I provide multiple community services as listed below for this open-source anti-censorship network utility project with over 60k stars on GitHub.

- Maintain the security infrastructure and protocols for internal collaborations
- Involve in new protocols' design and suggestions
- Manage documentation translations

Skills

I am nowadays familiar with the networking stack, general Linux environments (excluding kernel space). Most of my development are in C, C++ and Python now, but I do program with PHP and little JavaScript. I have been a daily user of Arch Linux and an AUR package maintainer for 5 years.

I have general understanding to Arduino, STM32, as well as embedded systems in general. I understand the concept of real-time operating system.

I am able to speak English, and a native speaker of Chinese Mandarin.

I am a student pilot, with private pilot certification exam currently scheduled December 27, 2022.