Jacob Shin

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Education

Temple University **BS in Computer Science (3.98 GPA)** Aug 2020 - May 2024

- Temple Association for Computing Machinery (ACM), Temple Hack-a-Hardware / Computer Security Club

Skills

Programming Languages: C, C++, Python, Javascript, x86 ASM
Other: Linux, Git/Github, Tmux, (Neo)vim, Ghidra, GDB, Binary Exploitation, Basic Reverse Engineering, Pwntools

Experience

Security Engineering Intern **Security Innovation** June 2021 - Aug 2021

- Identified several vulnerabilities in client software by forcing software into states not intended by the developers (e.g. XSS, CSRF, Access Control Bypass, Session Fixation)
- Achieved arbitrary JavaScript execution, escalated privileges from a low privileged user to an administrator user, deleted other users' resources, and accessed the data as a non-privileged user
- Wrote reports detailing the scope and severity of the vulnerabilities and recommended remediation steps
- Conducted research exploring the security of platforms using the ez80 CPU and presented it to the company

Undergraduate Research Assistant **Temple University** January 2021 - Present

- Implementing a proxy to interface with the IFTTT (If This Then That) platform and IoT (Internet of Things) devices.
- Utilized Node.js and the Express Framework to implement a Service API based on the IFTTT specifications

Intern **Princeton Plasma Physics Laboratory** Oct 2019 - Dec 2019

- Created schematics for a Langmuir probe, which is used to measure plasma properties like density and temperature

Projects

Calculator Controlled RC Boat (C++, TI-BASIC, Arduino)

- Utilized an Arduino and RF wireless modules to create the first ever calculator controlled, remotely controlled boat by interfacing a TI-84+ graphing calculator with a C++ library called ArTICL
- Enabled the library to support the TI-84+ calculator model by tracking down and fixing a bug in the implementation of the TI-Link protocol

TI-Authenticator: 2-Factor Authentication With a Calculator (C, HMAC, SHA1, OTP)

- Produced the first calculator app to provide rolling passcodes similar to Google Authenticator and Duo on a TI-84+ CE graphing calculator to enhanced login security via 2-Factor Authentication
- Implemented the two types of One-Time Password (OTP) algorithms from scratch based on the RFC 4226 and RFC 6238 specifications based on a custom implementation of the HMAC algorithm (for learning purposes)

Personal Blog and Capture the Flag (CTF) Security Challenge Writeups

- Described the process of reversing using Ghidra (reverse engineering tool), bypassing exploitation mitigation techniques like NX (Non-executable stack) & ASLR (Address space layout randomization), and leveraging Return Oriented Programming (ROP) to exploit a binary.

Awards

CTF (Capture the Flag Computer Security Competitions):

- 1st at CalPoly • 1st at castorsCTF20 (out of 500)* • 2nd at OwlHacks RSM CTF • 4th at MetaCTF 2020 * • 4th at RACTF 2020 (out of 1047)* • 13th at MITRECTF 2019 (out of 262) • 25th at PicoCTF 2019 (out of 11722)*

* denotes that I competed with a team