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Jason Ngo

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Skills Summary

Application Security	Buffer overflow, Format-string exploits, Return-oriented programming, Use-after-free
Web Security	SQL injection, Cross-site scripting, Template injection, Local file inclusion, Prototype pollution
Systems development	Rust, x86 Assembly, C / C++, Java
Web development	NodeJS, REST APIs, NGINX, Google Firebase
System administration	Linux, Docker, SQL

Work Experience

2020/04 - 2022/02 **Freelance Software Development**

Commissioned by clients for various projects. Some examples include:

- Transactions database — Designed proof-of-concepts for database solutions using Firebase Realtime Database, MySQL, and Google Drive APIs.
- Mosque timetable — Developed a web application to read data from a CSV file and display prayer times using HTML, CSS, and JavaScript.
- covidping.com — Wrote scripts to load current COVID-19 statistics into Google Sheets and send emails to a list of subscribers for to notify users of COVID-19 statistics in their state.

Technical Extracurriculars

2019/09 - Present **Capture The Flag Competitions**

https://github.com/Green-Avocado/CTF

- Reverse engineered binaries without symbols using Ghidra and Radare2.
- Performed dynamic analysis and debugged exploits using GDB.
- Identified vulnerabilities in binary applications and web services.
- Defeated common exploit mitigations such as position independent executables, address-space layout randomization, stack canaries, and relocation read-only.
- Created writeups to explain vulnerabilities and exploit techniques used in each challenge.

2017/09 - 2020/02 **Vex Robotics Club**

https://github.com/Green-Avocado/3388D-vex-robotics-edr-2020

- Wrote firmware in C++ which used the Vex API to receive instructions from a controller.
- Used feedback from sensor data to guide autonomous routines and aid user control.
- Created a user interface for the controller display screen to configure the robot at runtime.
- Our team won a programming award and we were invited to compete in the international event.

Hackathon Projects

2022/01 **Language Exchange**

https://github.com/Green-Avocado/Language-Exchange

- In a team of 4, created a website using React and NodeJS for connecting language students with complementary strengths and goals.
- Used Google Firebase to set up a database and user authentication, allowing users to log in using their existing Google accounts.
- Stored user data in the Firebase real-time database, which could be queried and filtered to match users according to their learning goals.

2021/11 **Speak-able**

https://devpost.com/software/speak-able-inclusive-unconferencing

- In a team of 4, created a website using NodeJS for encouraging inclusivity in participant-driven meetings.
- Used Express to implement a RESTful API to interact with the webpage, allowing users to submit new topics, vote for existing topics, and view the number of votes for each topic.

2020/08 **Study Tinder**
https://devpost.com/software/study-tinder
- In a team of 2, created a website for helping students connect and help each other study while social distancing.
- Used Google Firebase to set up hosting, a database, and user authentication.
- Matched students with complementary strong and weak subjects by using JavaScript to query the Firestore database.

2020/08 **BikePath**
https://devpost.com/software/bikepath-dkpstx
- In a team of 3, created a website to help users find alternative locations that would permit eco-friendly alternatives to driving, such as walking or biking.
- Used the Google Maps API to render a map view of selected locations on the webpage.
- Used Python to interact with the Google Places API to retrieve and format data for use by the webpage.

2020/08 **COVID Wait**
https://devpost.com/software/covid-wait
- In a team of 5, created a website to help users avoid highly populated areas and reduce the risk of exposure to COVID-19.
- Used Python to develop a server-side application to retrieve data from the Google Maps API.
- Implemented a RESTful API to allow clients to query data from the server.

Cybersecurity Projects

2021/03 - Present **pwndocker**
https://github.com/Green-Avocado/pwndocker
- Wrote a minimal program in C to create symbolic links without standard libraries.
- Used Docker and gdbserver to create an environment for debugging exploits against applications using different versions of the GNU C Library.
- The project became a go-to tool for CTF challenges involving binary exploitation.

2022/02 **BBY Stealer Malware Analysis**
https://github.com/Green-Avocado/bbystealer-malware-analysis
- Performed dynamic analysis using Wireshark identify external connections and Windows filesystem auditing to identify files read or modified.
- Reverse engineered JavaScript code that was obfuscated using obfuscator.io and packaged as a Windows executable using nexe.
- Helped affected victims with incident response by identifying compromised credentials and modified files.

2021/10 - 2022/01 **UBC MapleCTF**
https://github.com/ubcctf/maple-ctf-ubc-2022
- Wrote challenges in C with intentional vulnerabilities to progressively introduce and test binary exploitation techniques.
- Used Docker to containerize challenges so they could be deployed through Kubernetes.
- Helped beginners by running demonstrations at a workshop and answering questions related to binary exploitation and reverse engineering.

2021/09 - 2021/12 **EasyROP**
https://github.com/Green-Avocado/EasyROP
- Wrote a program in Java using principles of object-oriented design to automate the process of writing scripts for binary exploitation.
- The project began as a command-line application and later included a graphical user interface which was developed using Java Swing.
- Return-oriented programming payloads could be saved as a local JSON file and reloaded.

Personal Projects

2020/12 - Present **website**
https://github.com/Green-Avocado/website
- Used NodeJS with Express to serve web pages which are generated using a templating engine.
- Set up a reverse proxy using NGINX which secures connections using TLS and forwards requests to internal services.
- Used Docker to containerize internal services, allowing each service to be modified and restarted independently.
- Tested the website and scanned for vulnerabilities using continuous integration.

2021/11 - 2022/01 **atom-ide-rust**
https://github.com/rust-lang/atom-ide-rust
- Contributed to an open source plugin for integrating rust-analyzer into the Atom text editor.
- Used NodeJS to read config files, parse JSON data, and interface with a language server.
- Wrote documentation using markdown to explain the usage of the plugin with examples.
- The plugin has been downloaded over 164 000 times by developers programming with Rust.

2021/12 **discord-balance-tracker**
https://github.com/Green-Avocado/discord-balance-tracker
- Wrote a Rust application to provide users with a convenient way to track balances throught Discord.
- Used asynchronous programming to interact with the Discord API for sending and receiving interactions.

2021/03 **Etwahl**
https://github.com/Green-Avocado/Etwahl
- Wrote a program in C++ to bind signals from an electronic piano to simulated keyboard events.
- Received MIDI signals over a USB connection using the open source RtMidi library.
- Used CMake, X11 libraries, and Windows libraries to develop a multi-platform application.

Awards

2022/01 CyberSci Vancouver Regionals - First Place
2020/03 Vex EDR Alberta Provincial Tournament - Think Award

Education

2020/09 - 2024/04 **Bachelor of Science, Major in Computer Science**
University of British Columbia, Vancouver, BC