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Research Interests

My research interests lie in the intersection of computer security and low-level systems. I am interested in the security vulnerabilities posed by systems, and how they can be exploited. For now, I am working on my FYP thesis that is about reproducing CVE-2019-2215 which is the Use After Free vulnerability in Android Kernel's Binder IPC subsystem.

Education

PUCIT - University of the Punjab Bachelor of Science - Computer Science <ul style="list-style-type: none">Expected graduation: July 2023GPA: 3.65/4.0	September, 2019 – Present Lahore, Punjab, Pakistan
Punjab Group of Colleges, Okara Campus Intermediate of Computer Science with Physics <ul style="list-style-type: none">Graduated with 3rd position in BISE Sahiwal.	2017 - 2019 Okara, Punjab, Pakistan

Research Experience

Vulnerability Research and Exploit Development for Android Kernel July, 2022 – Present PUCIT - University of the Punjab <ul style="list-style-type: none">Supervisor: Dr. Muhammad Arif ButtFormulated the idea and initiated the research projectWorked on problems related to memory errors in binariesWorked on reversing binaries using IDA FreewareWorked on chroot jailbreakWorking on analysing Linux kernel

Professional Experience

Malware Researcher Ebryx (Pvt.) Ltd. <ul style="list-style-type: none">Working on Kernel Vulnerability Research and ExploitationLinux Kernel AuditingTools: IDA Pro, Ghidra, GDB, QEMU, etc.	March, 2023 – Present Lahore, Punjab, Pakistan
Teaching Assistant (Operating Systems) PUCIT - University of the Punjab <ul style="list-style-type: none">Designed material and coursework for the newly introduced lab component of the subjectDesigned exam papers for the labAssisted students in the lab + other TA responsibilities	October, 2022 – February, 2023 Lahore, Punjab, Pakistan
Programming Tutor Freelance on Fiverr <ul style="list-style-type: none">Teaching low level programming concepts in CTeaching object oriented programming in C++	April, 2022 – Present Fiverr.com

Skills

Programming Languages: C, Python, Java, C#, x86-64 Assembly

Security: Binary Exploitation, Reverse Engineering

Tools: IDA, GDB, GNU/Make

OS: MacOS, Linux

Projects

Unix Shell

C, Makefile

<https://github.com/alirazamumtaz/unix-shell>

- An effort to write the *nix based shell to gain understanding of how shell works and how OS creates and handles processes and allows processes to communicate with each other through it's IPC interface

Exploits Scripts

Python, x86 Assembly

<https://github.com/alirazamumtaz/exploit-development>

- Basic scripts that I have written to solve some exploitation challenges

Hack Assembler

C++

<https://github.com/alirazamumtaz/hack-assembler>

- A 16-bit machine language assembler for the 16-bit Hack Assembly Language. This was done as part of building a complete 16-bit computer during the Computer Organization Assembly Language Course

Courses & MOOCs

Computer Systems Security: pwn.college

- Shellcode Injection
- Sandboxing
- Reverse Engineering
- Memory Errors
- Race Conditions
- Kernel Security
- Program Exploitation

Extracurriculars & Volunteering

Club Leader

PUCIT - University of the Punjab

Google Developer Student Clubs

2021 – 2022 & 2022 – Present

- Faculty Contact: Assist. Prof. Abdul Mateen
- Organized tech workshops and seminars
- E.g. CodeFest, Hacktoberfest, etc

Event Organiser

PUCIT - University of the Punjab

Event Management Society

2020 – 2021 & 2022 – Present

- Organized inter-college events
- E.g. Job Fair, Trips, etc

Awards & Honors

Board Topper

2019

Intermediate - BISE Sahiwal

Sahiwal, Pakistan

- <https://pgc.edu/our-achievers/>
- Awarded with a brass medal and a cash prize by the Board of Intermediate and Secondary Education, Sahiwal