

Mayank Sharma

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EXPERIENCE

GNOME | GOOGLE SUMMER OF CODE INTERN

Report

May 2019 – Aug 2019 | Mentor: Ondřej Holý

- **Improved build times by ~40%**, by porting libgdata from (*autotools* + *make*) to (*meson* + *ninja*) build system, by writing build files for compiling and linking a shared library consisting of 100+ objects.
- Developed a new API (`GDataDocumentsProperty`) for libgdata (C library for Google Drive API), to support Properties Resource.
- Improved the copy, move, delete and `make_directory` operations in GVfs (earlier disabled).

WALMART LABS | SOFTWARE ENGINEERING INTERN

May 2019 – July 2019 | Bengaluru, India

- Helped improve number of concurrent users/hr by developing REST-based APIs for the Service Orchestration Layer for Walmart.
- Developed "**mozart-utils**", an npm package published to Walmart's in-grown npm repository providing standardized utility functions to over 8 sub-modules in a mono-repo.
- Collaborated with the team to develop 20 endpoints for Sams Mexico, which were used during a high-traffic sale event, with 99.9+% requests being served successfully.

EARLYSALARY | SOFTWARE DEVELOPER INTERN

May 2018 – July 2018 | Pune, India

- Worked directly under the CTO to design APIs and Algorithms, to retrieve and automatically assign a new case to a Pickup Agency based upon its priority in a cluster.
- Implemented centralized Authentication and Authorization, using JumpCloud's DaaS (**LDAP**).

KEY PROJECTS

LLC SIDE & COVERT-CHANNEL ATTACKS

IIT Kanpur | Prof. Biswabandan Panda

- Successfully mounted a covert channel attack on a victim running some benign process on a different core, using the FLUSH + RELOAD attack on cache, achieving 65+% accuracy.
- Developed a side-channel attack on the GnuPG cryptographic library, to observe cache accesses to critical functions to infer private key.

SECURE KEY-VALUE STORE | SYSTEMS SECURITY

Code

IIT Kanpur | Prof. Pramod Subramanyam

- Designed and implemented a secure key-value store (in Go) with sharing semantics under the assumption of a malicious datastore.

IMPROVING SECURITY OF ZOOBAR SERVER

IIT Kanpur | Prof. Pramod Subramanyam

- Exploited buffer overflow, format string, DoS vulnerabilities and crafted browser based attacks followed by fixing bugs and implementing principle of least privileges for better security.

GEM OS | OPERATING SYSTEM

Code

IIT Kanpur | Prof. Debadatta Mishra

- Implemented Multi-level paging, signals like SIGINT, SIGSEGV and SIGFPE, exception handlers like page-faults and divide-by-zero and added system calls like `expand`, `shrink`, `write`, `sleep`, `clone`, etc.
- Designed a scalable ext-2 like FUSE-based filesystem for GemOS.

EDUCATION

IIT KANPUR

BACHELOR OF TECHNOLOGY IN
COMPUTER SCIENCE

Expected to Graduate in 2020

CHILDREN SR. SEC SCHOOL

AISSCE CLASS XII (CBSE): 92.0%

CENTRAL ACADEMY SR. SEC SCHOOL

AISSE CLASS X (CBSE): 10.0/10.0

ACHIEVEMENTS

- ALL INDIA RANK 630
JEE ADVANCED 2016
- ALL INDIA RANK 2237
JEE MAINS 2016
- ALL INDIA RANK 854
KVPY 2015
- ALL INDIA RANK 1707
NSTSE 2014

SKILLS

PROGRAMMING

C/C++ • Typescript • Golang •
python • bash • x86 Assembly •
Glib

WEB

Node.js • MongoDB • Angular 7 •
AWS Lambda & EC2

OSes & TOOLS

Linux • Windows • gdb • Valgrind •
meson • Git • Vim • MySQL

COURSEWORK

- Compiler Design (*i*)
- Malware Analysis and IDS (*i*)
- Computer Networks (*i*)
- Secure Memory Systems
- Security of Critical Infra.
- Parallel Computing
- Systems & Cyber Security
- Operating Systems
- Blockchain Tech. & Applications
- Intro. to Machine Learning
- Database Systems
- Data Structures & Algorithms
- Software Engineering