Sid Agrawal

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EXPERIENCE

Staff Software Engineer - Operating Systems Virtualization
VMware by Broadcom
08/2025 - Present Bellevue, WA, USA
- Developed VMware ESXi hypervisor with a focus on confidential computing, and virtual machine partitioning.
- Utilized Intel TDX, AMD SEV-SNP, TPM, Attestation, PKI.

Doctoral Researcher - Operating Systems Architecture
Systopia Lab, University of British Columbia
01/2021 - Present Vancouver, BC, Canada
- Bootstrapped a research project, developing a prototype OS to compare various isolation mechanisms like Docker, Kata, VM (Xen, KVM) from an isolation and security standpoint, extending to new discoveries.
- Led a team of three engineers to develop an OS using 50K SLOC in C and ARM assembly on the seL4 microkernel, integrating hypervisor, device drivers, and isolation mechanisms with complete Source Code and Documentation.
- Developed Python tooling to analyze isolation mechanisms on Linux through Namespaces, Docker, QEMU, and Buildroot, with an accompanying Code and Wiki.
- Analyzed large-scale graphs in Neo4j to present isolation mechanism differences using CypherQL.

Intern, Security Research - Operating Systems Security
ARM
05/2022 - 08/2022 Remote, Canada
- Ported the seL4 microkernel to ARM's Morello experimental platform with hardware capability support (CHERI). Blog.
- Investigated kernel capability system, bootloader, context switching, and process bootstrapping code paths.

Software Engineer - Microservices and Tooling
Arista Networks
09/2016 - 12/2020 SF Bay Area, USA & Vancouver, BC, Canada
- Developed (Golang) and deployed (Kubernetes and Jenkins) micro-services to detect, report (Grafana), triage, and fix faulty test beds. This automation led to savings of 10s of person-hours per month per engineer. Expanded it from a solo project to a 3 member team
- Developed (Golang) and deployed services to store distributed file system's block data in a NoSQL (ScyllaDB) store
- Participated in DevOps responsibilities, for the Kubernetes, Redis, Swift and ScyllaDB clusters

Software Engineer - Distributed File Systems
Panzura
04/2015 - 08/2016 SF Bay Area, USA
- Designed and implemented (C) support to transactionally update file metadata for Panzura Global Distributed File System (ZFS on FreeBSD). This minimized recovery after crashes, thus preventing an entire class of support tickets.

Software Engineer - Solaris OS
Oracle/Sun
03/2012 - 04/2015 SF Bay Area, USA
- Enhanced the virtual memory predictor in Solaris by developing an algorithm to determine which segments in the address space can be upgraded to large pages

SUMMARY

Experienced software engineer with over 10 years of expertise in operating systems architecture and virtualization technologies, in multiple kernel's and low-level system programming in both x86 and ARM. My key achievements include developing a production-quality hypervisor for VMware ESXi, enhancing security for confidential computing environments, and leading a research initiative at the Systopia Lab that resulted in a publication on OS sandboxing mechanisms, demonstrating my ability to analyze and innovate in OS security.

EDUCATION

PhD in Computer Science
The University of British Columbia
01/2021 - Present Vancouver, BC, Canada

MS in Electrical and Computer Engineering
University of Florida
08/2010 - 12/2011 Gainesville, Florida, USA

BE in Electrical and Electronics Engineering
Birla Institute of Technology and Science, Pilani
08/2005 - 08/2009 Goa, India

PUBLICATIONS

Comparing Isolation Mechanisms with OSmosis
PLOS 2025, South Korea
Sidhartha Agrawal, Shaurya Patel, Linh Pham, Arya Stevinson, Ilias Karimalis, Hugo Lefeuvre, Aastha Mehta, Reto Achermann, Margo Seltzer
https://dl.acm.org/doi/10.1145/3764860.3768325

Securing Monolithic Kernels using Compartmentalization
ArXiv 2024
Soo Yee Lim, Sidhartha Agrawal, Xueyuan Han, David Eyers, Dan O'Keeffe, Thomas Pasquier
https://arxiv.org/pdf/2404.08716

CHERI-picking: Leveraging capability hardware for prefetching
PLOS 2022, Germany
Shaurya Patel, Sidhartha Agrawal, Alexandra Fedorova, and Margo Seltzer
https://dl.acm.org/doi/pdf/10.1145/3623759.3624553