

MINCHEOL SUNG

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EDUCATION

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| Virginia Tech Ph.D. in Computer Engineering | Blacksburg, Virginia Expected May 2022 |
| M.S. in Computer Engineering | Dec 2018 |
| Sungkyunkwan University B.S. in Computer Engineering | South Korea Feb 2016 |

TECHNICAL STRENGTHS

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| General Programming | C, x86 Assembly, Rust, Bash, Python, Java, C++ |
| Systems Programming | Linux, NetBSD, Google Fuchsia, VMware ESXi, Xen, KVM, Rumprun unikernel, HermitCore unikernel |

WORK EXPERIENCE

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| VMware, Inc. Intern, Member of Technical Staff – VM monitor team | May 2020 - Aug 2020 |
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- SEV-ES remote attestation: Implement an attestation feature for Virtual Machines using a new HW feature (AMD SEV-ES) that is available on the latest generation of CPUs. Develop SW that handles encryption keys, verifying Virtual Machine launch measurement, and injecting and reading out private information from the encrypted guest Operating System, where the data is protected against access by the hypervisor.

RESEARCH PROJECT EXPERIENCE

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| Virginia Polytechnic Institute and State University Graduate Research Assistant, research interest: Operating Systems, Virtualization | Aug 2016 - Present |
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- Intra-unikernel isolation: Although the isolation between unikernels is generally recognized to be strong, there exists no isolation within a unikernel. This is due to the use of a single and unprotected address space, a basic principle of unikernels from which result various lightweightness and performance benefits. In this project, we propose a new design bringing memory isolation inside a unikernel instance while keeping a single address space. We leverage Intel's Memory Protection Key to do so without impacting the lightweightness and performance benefits of unikernels. We implement our isolation scheme within an existing unikernel and use it to provide isolation between trusted and untrusted components: we isolate (1) safe from unsafe Rust kernel code and (2) kernel from user code.
- LibrettOS: LibrettOS is an OS design that implements two paradigms to address issues of isolation, recovery ability, and performance. LibrettOS acts as a multiserver OS in its basic form and shares hardware resources through system servers. For selected applications requiring performance, LibrettOS also acts as a library OS where the applications are granted exclusive access to virtual hardware resources such as storage and networking. I implemented a network server as a prototype server of the multiserver OS mode.