Thunderlane

Virtualization Research Platform

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OVERVIEW

Thunderlane is a platform intended for proving new research concepts in hypervisor architectures and implementations that will enable more robust, secure and performant virtualization solutions for the future. Thunderlane defines a new computing model that dissolves the boundary between hypervisor and operating system and leverages state-of-the-art software diversity techniques. In concert, these capabilities provide unparalleled resistance against reverse-engineering, and ensure the reliability and security of application and system software. Thunderlane leverages the open source Bareflank Hypervisor SDK to demonstrate new security features for a variety of use cases, including software guards (AFRL ISSE Guard) and cross-domain filters (DARPA SHARE).

KEY BENEFITS

- **Simple Deployment**: Transform an operating system into a virtual machine while it is already running.
- **Versatility**: Supports a variety of devices and platforms, including ARM and Intel, using Windows or Linux.
- **Seamless Performance**: Realize a near-native user experience through tight integration with host operating system components.
- **Integrate Anywhere**: Liberal licensing allows users to easily integrate with any commercial software without forcing others to expose their proprietary code.

Thunderlane-Enabled Research

Binary Diversification
Reduce attack surface through compile time, load time and run time code randomization

Tighter Coupling of Software & Hardware
Generate software intrinsics from machine-parsable CPU specifications

Hardware Assumption Verification
Compare CPU implementation against abstract specification

Modern Programming Safety Features
Develop using C++17, and transpile C based dependencies into Rust

ABOUT AIS

AIS is a cyber and information technology company that plays a leading role in supporting critical cyber operations for the United States Department of Defense and Intelligence Community. AIS employs cyber engineers and scientists throughout the United States.

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FOR MORE INFORMATION

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