

Introduction

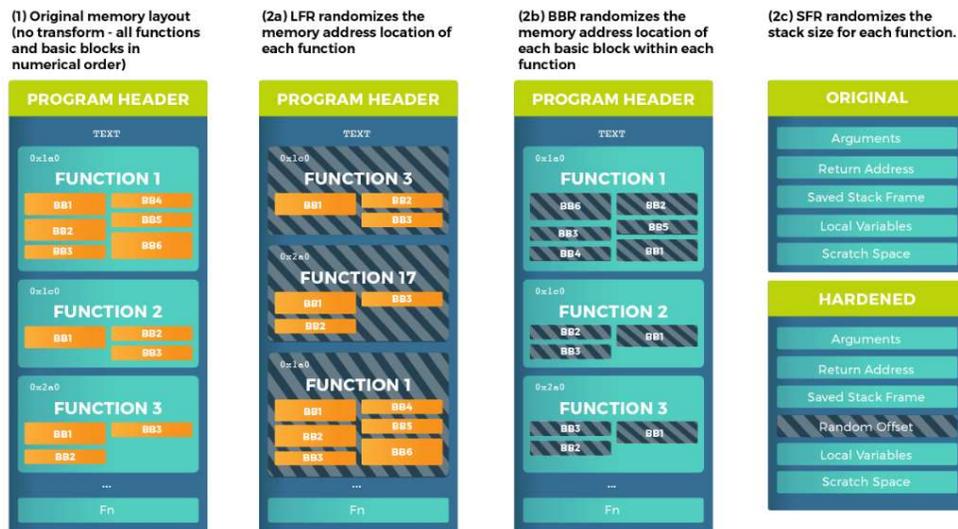
RunSafe Security, Inc. is a cyber defense company. Its Alkemist[®] software operates across a wide range of hardware platforms to immunize software and firmware programs from memory corruption exploits, the biggest threat to software today.

The Problem: Memory Corruption Vulnerabilities

Increased cyber resilience is imperative for mission assurance and success. 40% of CVE's relate to memory corruption (e.g. heap overflow, stack overflow), representing the largest group. Scanning and patching alone leave your software with significant exposure.

The Solution: Alkemist

Alkemist provides run-time protection to a wide range of systems without changing original functionality. Alkemist application makes each instance of software functionally identical but logically unique, meaning attackers can't access vulnerabilities. Target software includes in-house developed, COTS, GOTS, and open source running on IT enterprise equipment, OT and IoT devices, and specialized embedded systems. Alkemist protected software components are immunized against memory corruption attacks, including zero-days. Alkemist disrupts memory exploitation by varying the attack surface (the layout of your code). This entropy makes writing reliable exploits extremely difficult for hackers.



The Alkemist:Source module is applied when a program is compiled, without changing source code, compilers, or linkers and has the Load-time Function Randomization (LFR) transform (**Fig 2a**). Whenever a protected program, library, or shared object is loaded into memory, LFR randomizes its function locations before process execution begins. The Alkemist:Binary module is applied to compiled binaries before deployment and has the Basic Block Randomization (BBR) transform (**Fig 2b**), which relocates the basic blocks of a function, and the Stack-Frame Randomization (SFR) transform (**Fig 2c**), which places random buffer offsets into a function's local stack frame.

Traction

Alkemist is TRL 8 in the commercial market, with implementations and trials with Vertiv, Avocent, Bosch, Samsung, and Cisco. Alkemist is TRL 6/7 in the DoD market including NAVWAR, NAVAIR, and AFWERX implementations.