

ERA - Embedded Runtime Agent

Essential Protection for Embedded
Systems Against Known and
Unknown Threats

Embedded Device Agents Offer Unique Protection

The rising number of publicized vulnerabilities, offensive activities and cyber-attacks on connected products, and the variety of malware samples and types crafted specifically for embedded devices, reflect the growing opportunity for attackers presented by the proliferation of IoT and connected devices.

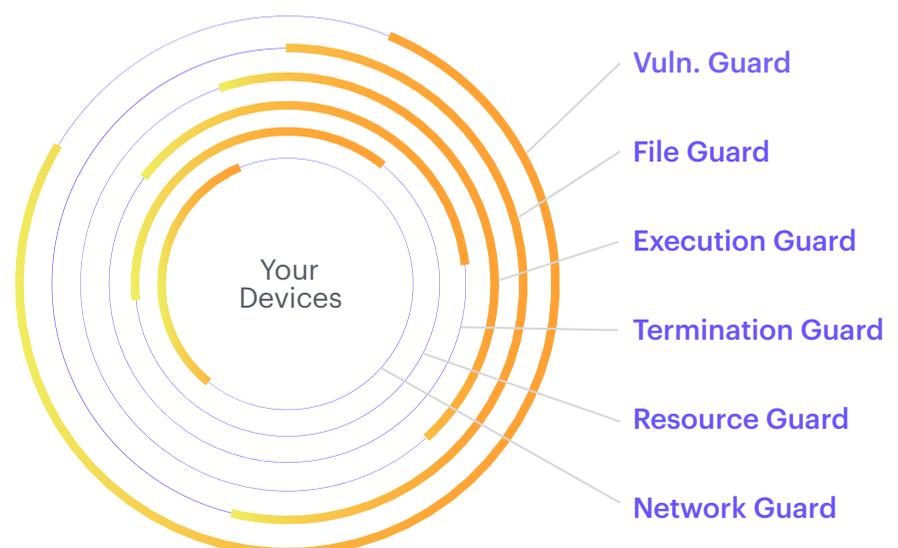
Commonly considered approaches to preventing cyber - attacks on connected devices - installing the most updated patches or modifying device code - can be very challenging to implement while introducing new risks. In many cases, this results in devices in the field with outdated software that are exposed to high risk.

An embedded security agent offers a unique opportunity to ensure long-term protection of connected devices, as it protects against both known and unknown threats in real time and provides mitigation capabilities in case of a security event.

Agent Tailored for Your Specific Device

Due to connected devices' diverse attributes and security needs as well as processing and memory constraints, it is not possible to design one agent type that protects all devices. To be both feasible and effective, an embedded device security solution must support fast and simple creation of customized agents for all targeted device models.

The Vdoo Embedded Runtime Agent (ERA) is a security agent designed from the ground up to fit the requirements of connected devices. It is automatically tailored for each device model based on deep analysis of its firmware binary performed by Vision, Vdoo's automated device security analysis solution. The analysis process produces a full mapping of the device's attributes and configuration, identifying the allowed processes, the usage of different files, and the processes that are most vulnerable to attacks. ERA is then generated automatically with the relevant security guards and their optimized configuration, based on the findings of the Vision analysis.



Product Highlights

Real-time detection and prevention of threats for connected and IoT devices

Automatically tailored per device to provide needed protection layers with minimal footprint and negligible performance impact

Mitigates device software vulnerabilities without risky and complex software patching or re-coding

Multi-layered approach providing robust protection against known and unknown threats on connected devices based on Vdoo's rich domain expertise

Fast and easy integration without requiring changes to the device code

Operates without a network connection, protecting both online and offline devices

Detailed real-time logs of device activities that can be integrated with external SOC, SIEM and other systems

Mitigate Threats Efficiently

Vdoo's goal is to provide the simplest methods of addressing device security issues at all stages of the product lifecycle. ERA can help mitigate many threats caused by device software vulnerabilities without the need for software patching, re-coding, or architectural modifications. Device vendors can leverage ERA to achieve long-term security even on legacy products and postpone complex patches or upgrades.

Active Protection Against Varied Threats

Vdoo ERA provides advanced runtime protection capabilities against both known and unknown threats by detecting suspicious device activity, creating real-time security alerts, and actively preventing actions typically taken by attackers when attempting to compromise embedded systems. It blocks varied attack methods such as the use of default credentials, exploitation of unsecured APIs and other software vulnerabilities, leveraging faulty communication protocols, firmware overwrites, or execution of brute-force attacks.

Multi-Layered Security Approach

ERA's multi-layered approach utilizes dozens of mechanisms to separately prevent each step of the attack, providing robust security in an increasingly complex threat landscape. These mechanisms can be split into three conceptual layers:

- Exploit mitigation - prevents any initial remote code execution
- Abnormal resource utilization - indicates the existence of malware
- Protection of critical assets - prevents the attacker from harming the device's integrity, thus ensuring business continuity

Lightweight Agent Designed for Connected Devices

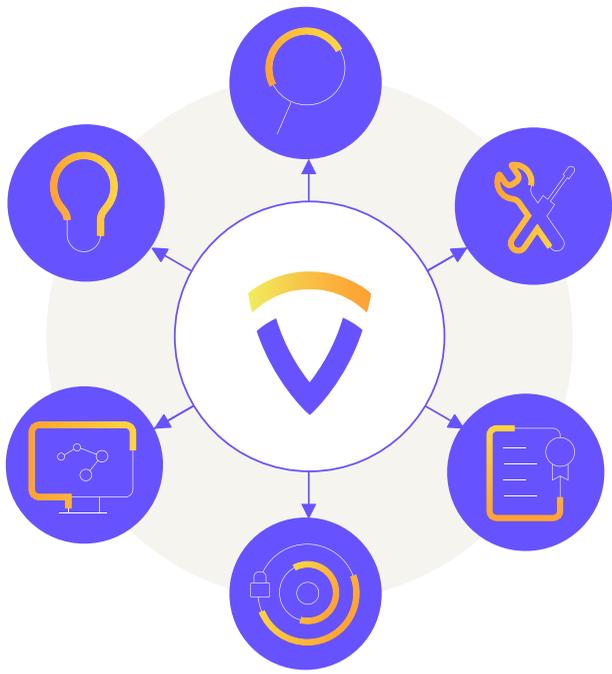
Because ERA is created for each specific device based on in-depth analysis of its components, characteristics and configuration, it conforms with the device's CPU and memory resources and only includes protection measures that are relevant to the specific device. The result is maximal effectiveness with minimal footprint and negligible performance impact.

Easy and Fast to Deploy

ERA is generated with a simple one-click experience based on an automatically defined device-specific optimized policy. Device vendors have the flexibility to adjust the agent's configuration granularly if desired, according to their needs and preferences. In addition, ERA is independent and is designed to integrate very easily into devices, without requiring modification of the device code.

Built on Industry-Leading Device Security Expertise

Vdoo's offering is built on the extensive experience of our team that includes world-class experts in embedded system architecture and security research. The team has analyzed thousands of firmware images, hundreds of millions of binaries, and thousands of vulnerabilities to generate a vast device security knowledgebase and has so far discovered more than 300 new zero-day vulnerabilities. The team continually validates the ability of ERA to block attacks and emerging IoT malware such as Mirai, VPNFilter, Torii, and Chalubo.



The Vdoo Integrated Device Security Platform

Vdoo ERA is part of the Vdoo Integrated Device Security Platform, the only automated device security platform that covers the entire device lifecycle – from design, development and testing to deployment and maintenance.

Our platform provides everything companies need to secure their connected products consistently at scale. Our threat intelligence operations provide relevant and updated device-focused data which, combined with robust machine learning capabilities, becomes the basis on which the entire platform functions.

Vdoo ERA Benefits



Lower security risks

Detect and block a broad range of security threats in real time including new vulnerabilities and zero-day exploits



Increase efficiency

Mitigate vulnerabilities quickly by deploying an agent rather than fixing them via patches or code changes when possible



Protect your reputation

Fortify your devices and ensure long-term security after deployment



Increase visibility

Gain valuable real-time data on in-field devices' activity and exploit attempts



Monetize device security

Differentiate your products and create premium offerings with post-deployment device runtime protection



Enhance security operations

Integrate ERA with SOC and SIEM systems to enhance existing threat detection and response mechanisms

Product Specifications

Supported OS	Linux Android
Supported CPU architecture	MIPS ARM x86_64
CPU overhead	<1%
Storage overhead	<1MB
Operation modes	Online/Offline Active/Passive/Learn

(Note: exact CPU and memory usage depends on the device and the agent configuration)

About Vdoo

Vdoo was founded by serial entrepreneurs who previously sold cybersecurity company Cyvera to Palo Alto Networks, bringing with them extensive knowledge of endpoint and embedded system security. The company has raised \$45 million from top-tier investors including 83North, Dell Technology Capital, WRVI Capital, GGV Capital, NTT DOCOMO and MS&AD ventures. Vdoo has offices in the US, Europe, Japan and Israel, and dozens of well-known global customers.

For additional information, please contact us at info@vdoo.com or visit our website at <https://vdoo.com>