Who is InZero

We invent, patent & build usable solutions

- ✓ Privately held R& D firm (Sterling, VA)

- ✓ Dedicated to deep, hardened cyber security overcoming known software risks

- ✓ All technologies: Primary focus is Intrusion Prevention not Detection

- ✓ Recently selected for Full OTA Proposals for SIPR/NIPR mobile device for NIWC

- ✓ Has available cleared developers, etc. (Cohere Technology Group, Omega KR) and engaged with GDIT Combatant Command group

- ✓ Awarded 8 U.S. Patents since 2018

Hardware-enforced security because standard software doesn't do the trick

TRIPLiot Hardware Enforced Data Separation

- ✓ Establish A SEPARATE IN-DEVICE MINI-VM/OS/Container on any chip that support SoC
    - ✓ no need for physical access to update device firmware
    - ✓ provides advanced protection against malware
- ✓ Automatically checks firmware update electronic signature
- ✓ VM/OS is independent and inaccessible from the host OS, making it immune to malware which may affect the device OS
- ✓ SYS ADMIN can access the VM/OS remotely and simultaneously across the entire fleet of devices
    - ✓ Minimizes enterprise attack surface
    - ✓ Allows for rollback to known good OS so immunizes against ransomware and other attacks
- ✓ Security and integrity checks, patches, and updates are run in parallel during normal operation

What TRIPLiot does for the mission

- ✓ Detect control system threats faster, in near real-time

- ✓ Improves situational awareness with near real-time integrity checks and provides the ability to respond at machine speeds.

- ✓ Breaks the kill-chain of many adversary exploits prior to completion and provides the capability to mitigate successful exploits at machine speeds.

- ✓ Inherent integrity checking capability provides a wealth of info on indicators and informs further mitigations.

- ✓ Fully compatible with the referenced open-system architecture across the Services.

Hardware-enforced security because standard software doesn't do the trick

Fundamental Patented Architectural Innovation

Hardware-Enforced

- ✓ **Layered Defense in Depth**
- ✓ **Secure Boot, TrustZone-based key storage**
- ✓ **Encryption, hardened OS and firewall**
- ✓ **Separation of device management & operation**
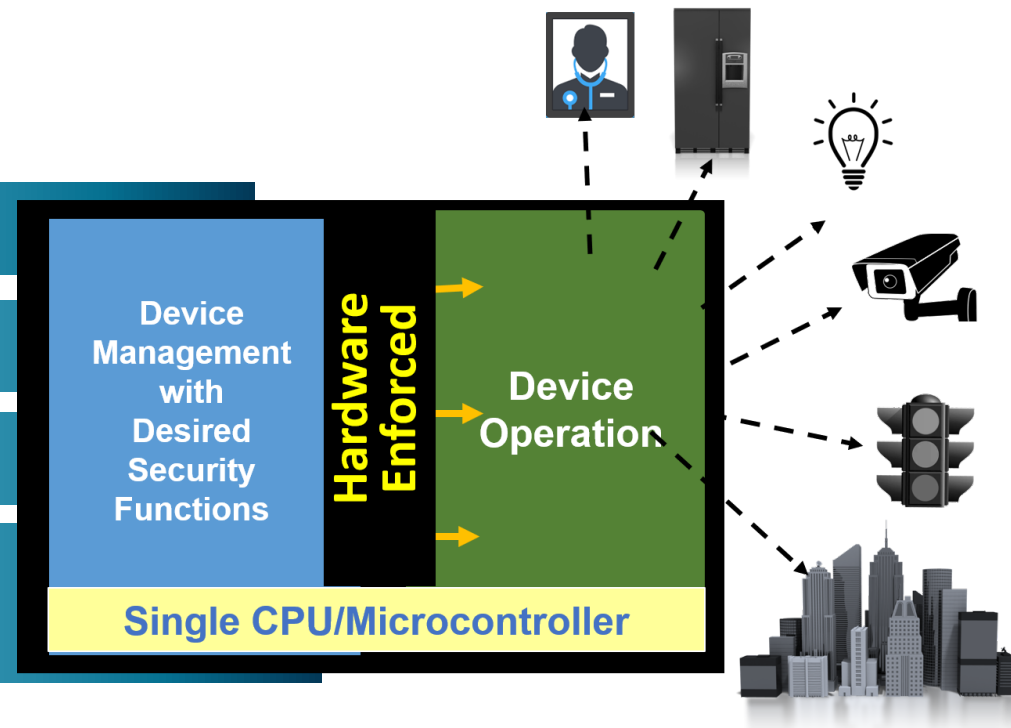
Device Management with Desired Security Functions

Hardware Enforced

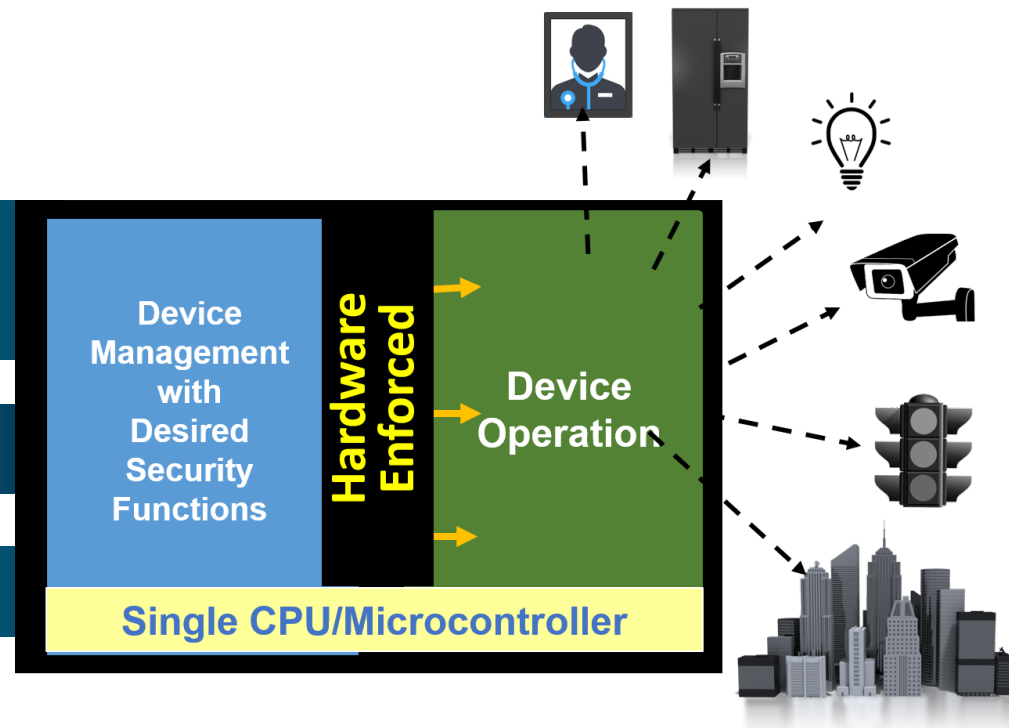**Device Operation**

Single CPU/Microcontroller

Solving Critical Patching & Updating Problems with Reliable Realtime Efficient Hardware-enforced Security

Fundamental Patented Architectural Innovation

Updating

✓ **Real-time automatic during normal device operation**

✓ **Remote – no need to physically access device**

✓ **No delay, no complex user procedure**

Device Management with Desired Security Functions

Hardware Enforced

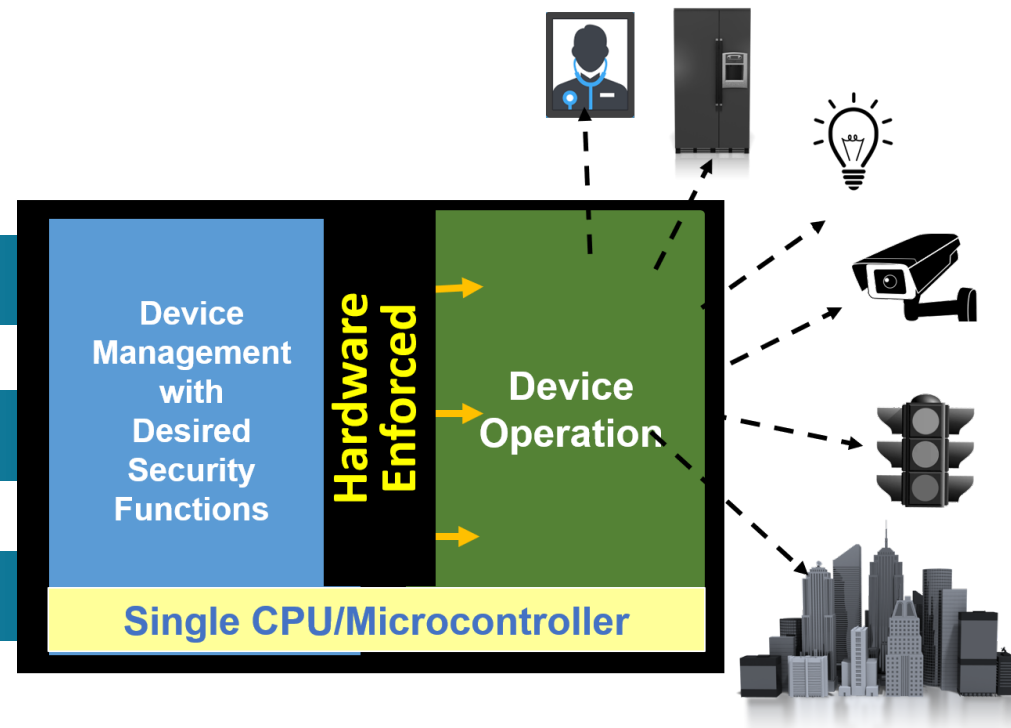**Device Operation**

Single CPU/Microcontroller

Solving Critical Patching & Updating Problems with Reliable Realtime Efficient Hardware-enforced Security

Fundamental Patented Architectural Innovation

Integrity Check & Behavioral Monitoring

- ✓ **Continuous**
- ✓ **With attestation**
- ✓ **Alert can trigger automatic response**

Device Management with Desired Security Functions

Hardware Enforced

Device Operation

Single CPU/Microcontroller

Solving Critical Patching & Updating Problems with Reliable Realtime Efficient Hardware-enforced Security

Device-network connectivity

The IoT Challenge

Inadvertently bricking a fleet
of devices with a **bad firmware update**

The TRIPLiot Solution

- **Automatic rollback** from non-working firmware updates

- **Dedicated setup** mode to work in inverse connectivity mode - IoT device works as an access point allowing direct connection and configuration fixes

- Ability to perform **manual firmware update** from the mobile phone as alternative to OTA

. . . because simple mistakes can lead to not-so-simple problems

Device Security

The IoT Challenge

New device **lacks intended security** during operation experiences **security incident** that requires fastest reliable update

The TRIPLiot Solution

- Integrated best security practices and provide them as the unified, working **out-of-the-box** IoT platform

- **Long term support package** for SW building with TRIPLiot code, tools, flashing, provisioning, using signing tools, etc.

- Security core is **separated** from the business application as much as possible

- Provides **automatic** security patching using **OTA** firmware updates

Out-dated firmware = No real security

Flexibility

The IoT Challenge

The challenge in satisfying **customer demands and requirements** over time

The TRIPLiot Solution

- Has **modular, flexible, and extensible** architecture

- Security core separation and automatic OTA updates facilitate **easy, fast modification** of functionality

- **Minimal** user participation

Making it easier when things change . . .

Scalability

The IoT Challenge

The need for a properly designed and cost-effective **IoT enablement cloud technology** to meet scalability needs

The TRIPLiot Solution

- Uses scalable **serverless cloud services** (IoT Core, Lambda, DynamoDB, S3) and do not consume resources in idle state

- Firmware distribution using **Content Delivery Networks (CDN)**

- **Low administrative overhead** – automated maintenance, integrity checks, recovery

Always being ready for the inevitable increase in the required number of devices

Maintenance

The IoT Challenge

Real-world conditions that can cause **unexpected errors and failures** as well as hacker attacks, creating the need for continuous monitoring, problem detection, and timely support and maintenance

The TRIPLiot Solution

- **Supports** performance, security, health and cost metrics and alerts

- Settings can be configured on **individual** (device) or group bases

- **Scheduled or ad-hoc** state/configuration inspection (compliance, remote attestation) and real-time telemetry

Always being ready for the inevitable increase in the required number of devices

A Quick Summary

Secure
- ✓ Comprehensive with 20 features
- ✓ Maximum hardware-enforcement
- ✓ Continuously vigilant

Already developed for easy adaptation & integration

Fast
- ✓ Immediately responsive
- ✓ OTA without complex user action
- ✓ Simultaneous throughout fleet

Reliable
- ✓ Automatic
- ✓ Repeatable
- ✓ Separated & Isolated

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