SPIRE + Regorus in OpenSOVD-CDA

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Eclipse SDV Hackathon 2026 |
Project Overview

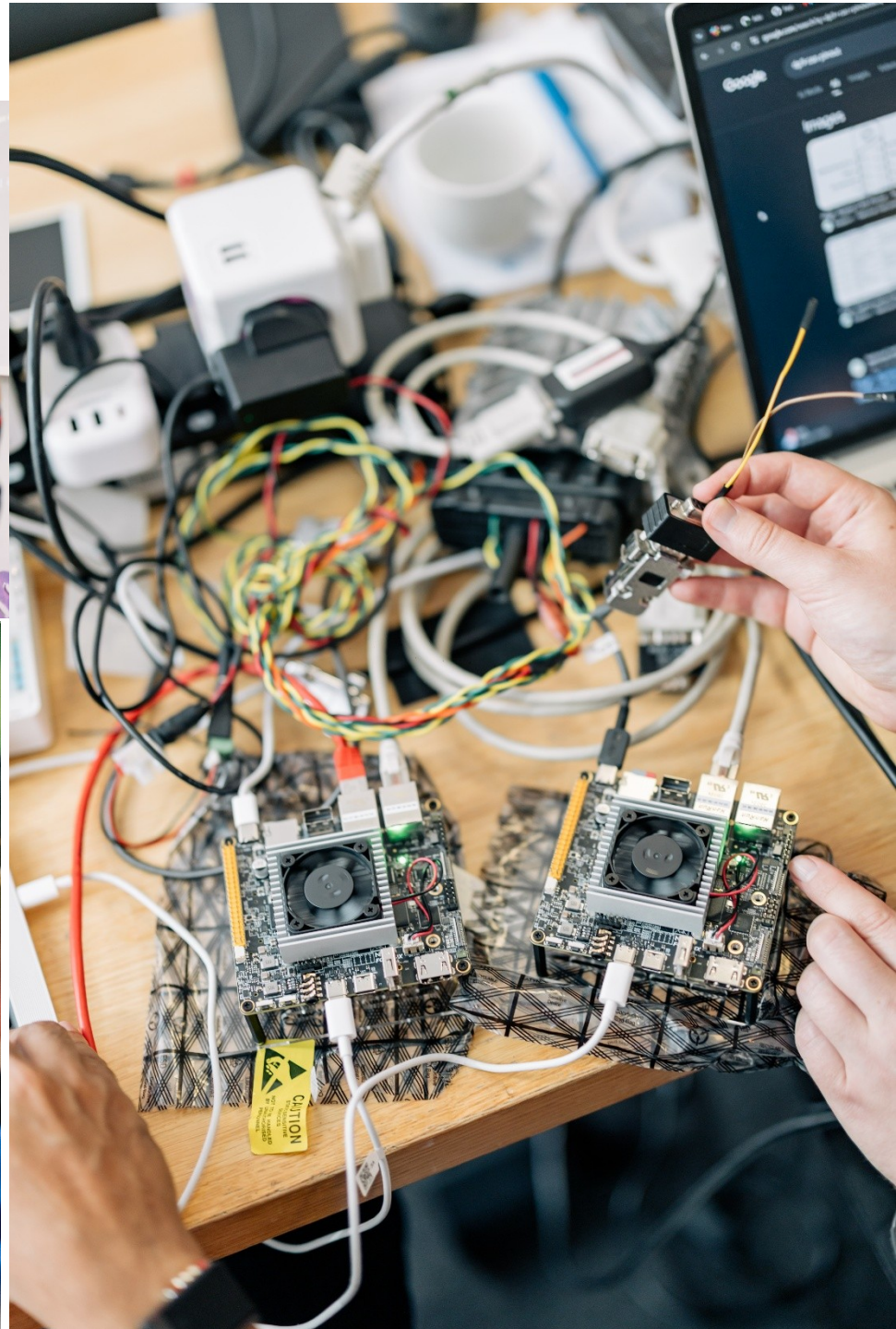
Team Name: Oxidized Powertrain Hack Force (OPHF)



Event Photos – Cummins Team







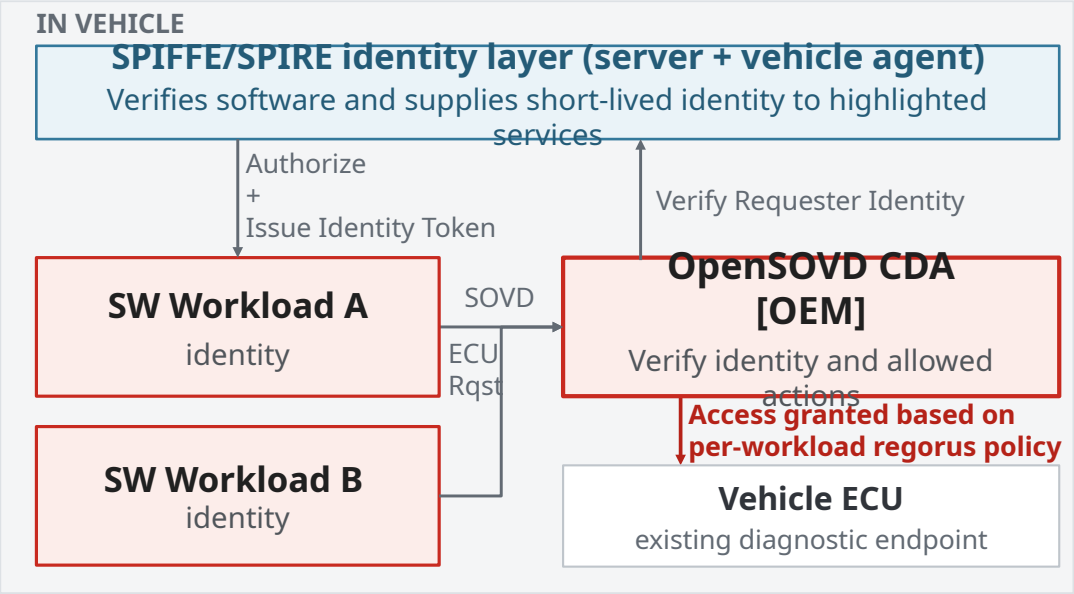


Cummins Challenge: Better In-Vehicle Security for SOVD CDA

In-Vehicle Authentication and Access Control using SPIRE+Regorus with OpenSOVD

Red: modified services
Blue: added identity layer

SIMPLIFIED COMMERCIAL SDV BLUEPRINT



CUSTOMER IMPACT

Authentication

[Is this software what it says it is?] SPIRE implicitly verifies running software is legitimate and issues workload identity [no long-lived secrets embedded in workloads like OAuth]

Authorization

[What is this software allowed to do?] Regorus checks permissions in a local policy for each workload identity before a command can proceed. [Flexible policy definition beyond what OAuth provides]

Connectivity Resilience

No round trip communication with remote systems (e.g. cloud), ensuring connectivity resilience. [No persistent cloud connection required like OAuth]

Improved in-vehicle authentication and authorization capabilities

A more flexible and manageable model of in-vehicle workload management for integrating software from mixed suppliers for OEMs

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Why SPIFFE/SPIRE + Regorus instead of Oauth for workload authentication?

OAuth remains useful for delegated access and external APIs.
The in-vehicle gap is more basic: identify the running workload

OAuth-only service identity leaves vehicle questions

Who provisioned the bootstrap credential for each service?
How are many long-lived credentials managed when many services need individual identities?

- How is it rotated across vehicles?
- Does possessing the credential prove which workload is actually running?
- What happens when enterprise connectivity is unavailable?

SPIFFE/SPIRE + Regorus creates a local identity-and-policy plane

SPIRE Agent: implicitly attest the running workload from its runtime context (e.g. docker image signature), not from a long-lived static application secret embedded in the application
SPIFFE ID: assign stable workload identity such as spiffe://.../powertrain-mode-controller.
JWT-SVID: carry application identity through MQTT/uProtocol and local HTTP calls.
Regorus: evaluate explicit local policy: workload ID + requested operation = ALLOW or DENY.

Note: OAuth can use strong client authentication, including certificates. The point is not that OAuth is weak; it is that OAuth does not standardize workload attestation and per-workload credential issuance.

SPIRE creates the vehicle workload identity plane. Regorus turns that identity into explicit behavior policy.
OAuth stays whereever it is needed.

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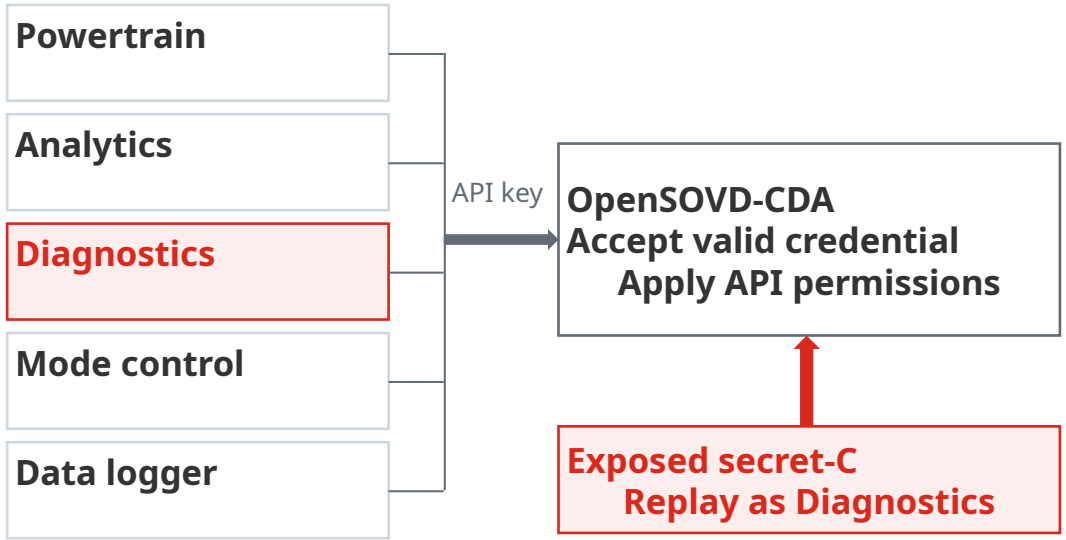
Embedded credentials can leak; Implicit identities can’t

Five workloads, one OpenSOVD-CDA: embedded secrets vs. runtime-attested identity

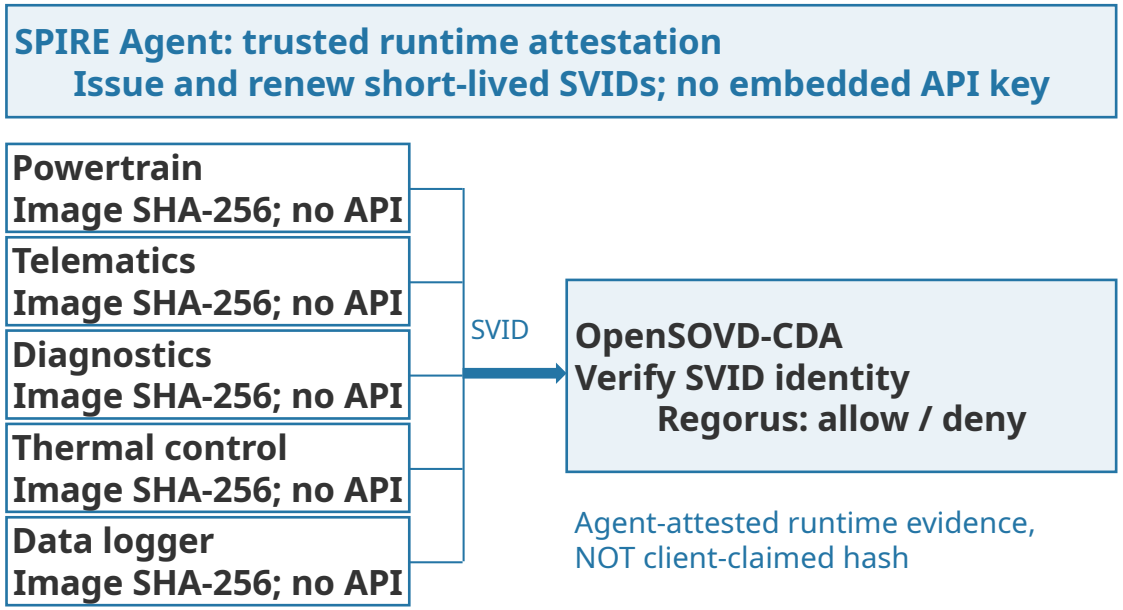
EMBEDDED API KEYS / CREDENTIALS

Each workload stores a reusable credential



Any one leaked key can be used to impersonate its workload.

SPIRE-ATTESTED WORKLOAD IDENTITY



Changed image → changed SHA-256 digest.

OEM manages trust and policy – avoid a large set of stored API secrets or other credentials

No manual per-workload secret tracking.

*Requires trusted agent/runtime and automated registration policy; a hash alone is not attestation.

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