COVESA SDV Telemetry Project

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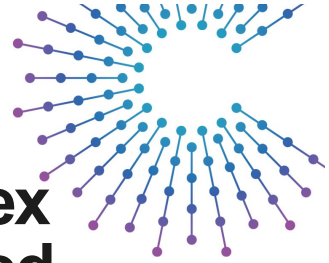


WHY IS SDV TELEMETRY IMPORTANT?

Hyperintegration

SDVs are increasingly complex and unified oversight is needed.

Continuous Integration & Development

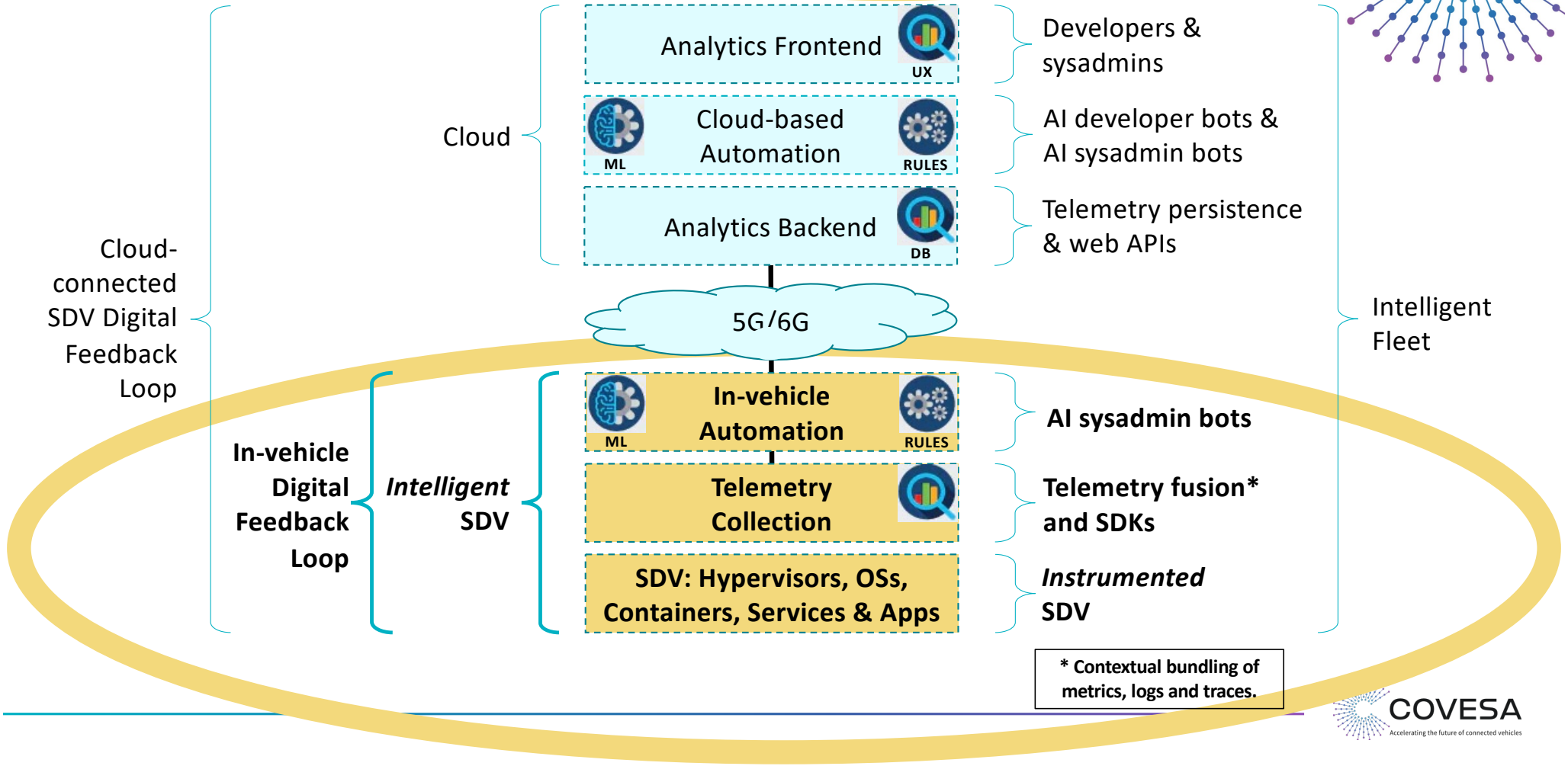
Developers need insights into SDV execution.

Operational Automation

In-vehicle and cloud-based intelligent systems require telemetry.

To enable new intelligent SDV use cases, telemetry data is required.
→ to power the ML and AI-infused digital feedback loops.

Intelligent SDV Overview (project scope in bold)



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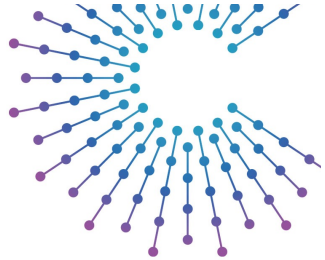


SDV Telemetry Project *value creation* ("why")

- Make developer workflows faster/smarter.

  → Enable systems to be observable, navigable and understandable.

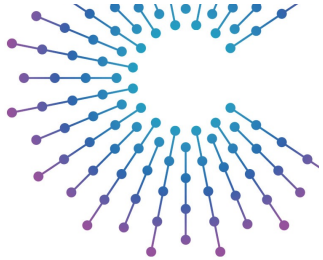
- Create new operational use cases and user experiences

  → Enable in-vehicle and cloud-based SDV intelligent monitoring and digital feedback loops.

SDV Telemetry Project *value delivery* ("how")

- Provide SDKs to the SDV ecosystem to instrument software explicitly.
- Provide collectors to gather data sources into a common telemetry format.
- Provide a telemetry engine for ML and rules-based telemetry processing.
- Provide low-code/no-code automated SDV monitoring with ML and wizards.
- Provide a single source of SDV truth for communication to the cloud.

The Observability* Problem

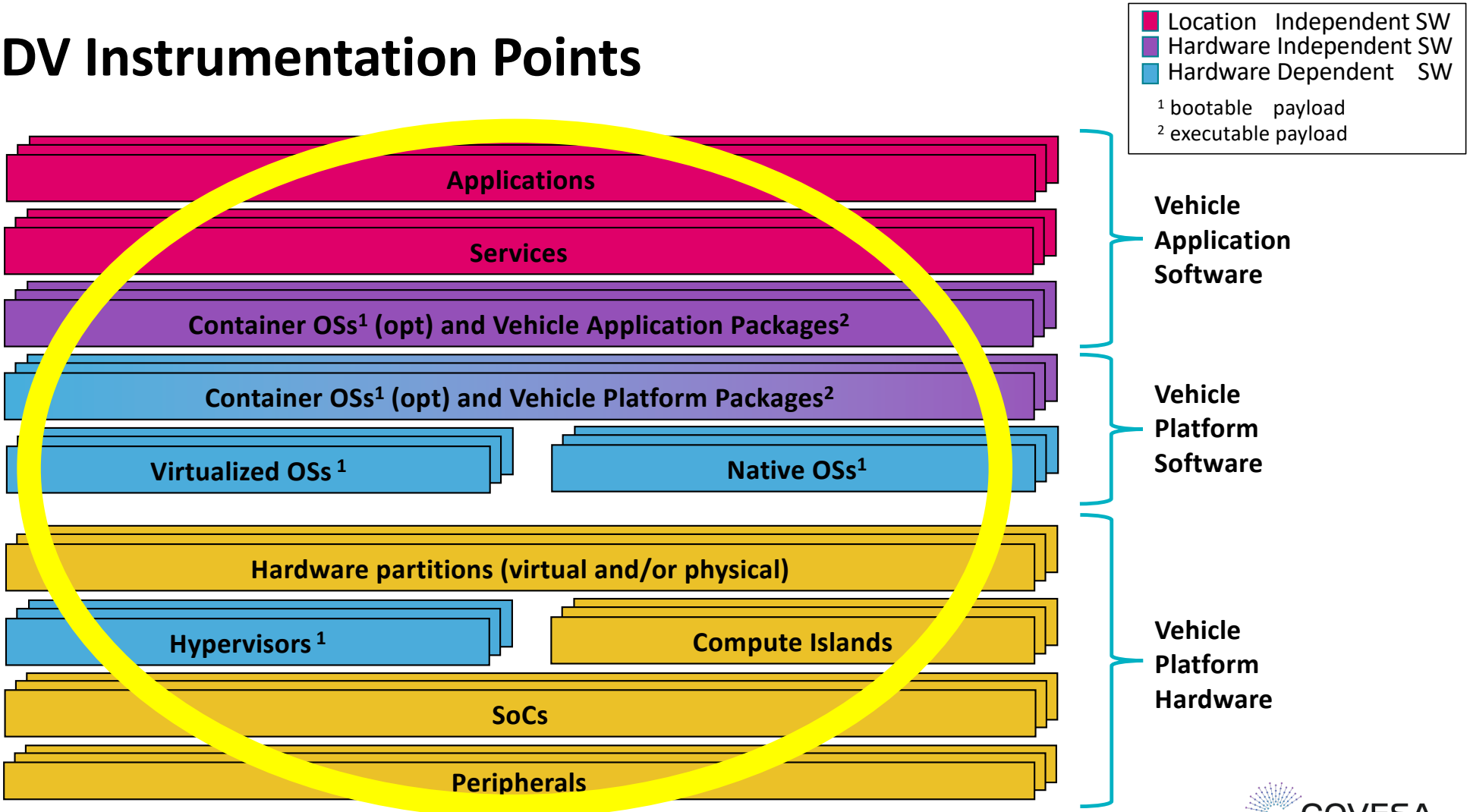


Observability is the measure of how well a systems internal operation can be known externally.

- Observable systems can be monitored to ***stop past failures from reoccurring***.
  → well suited to machine learning, predictive detection & automation to determine ***corrective action***.
- Complex SoA-based systems require significant run-time instrumentation to be ***monitored adequately***.
- Goal of observability is not just to monitor & detect issues, but also to ***understand system behavior***.
- System metrics, logs and traces all improve system observability, which enables ***root cause analysis***.
  - **Metrics** can be time measurements, counters or gauges (other measurements)
  - **Logs** (AKA events) provide detail (audit info, alarms, exceptions, state changes, etc.).
  - **Traces** capture a serial or parallel execution sequence of an instrumented workload.

* https://linkedin.github.io/school-of-sre/level101/metrics_and_monitoring/observability

SDV Instrumentation Points



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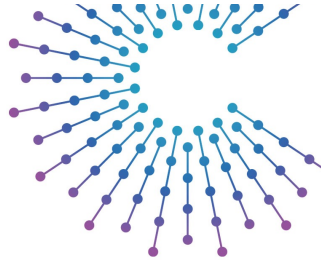
Sources of SDV Telemetry Data



- COVESA Debug, Log & Trace
- AUTOSAR Log & trace
- Linux perf
- Android trace, systrace & perfetto
- ECU run-time monitoring
- Linux proc & syslog
- Application & service logs
- Logging and tracing SDKs
- Telemetry collectors
- Silicon performance counters

To analyze these using centralized automation, a standard to identify the data format and associated context is needed.

Scope of SDV Telemetry Project and Touchpoints

- SDV use cases
- SDV telemetry project focusses on in-vehicle telemetry:

  → instrumentation SDKs, collection services, fusion, ML & rules, persistence, and cloud connectivity/spooling
- SDV telemetry project is SDV-platform independent
- → Will need to select a reference FOSS platform
- SDV telemetry project is cloud-platform independent
- → Will need to select a reference analytics backend and frontend
- SDV telemetry project will coordinate with other industry organizations to ensure alignment

  → SOAFEE, Eclipse SDV, LF CNCF, AGL, other?

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Questions
Discussion
Next Steps

Thank you!

OpenTelemetry?