
AWS
re:Invent
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AUT305

Edge computing for automotive data logging

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Agenda

Introduction: Opportunities for accelerating product development

Evaluating an example automotive use case

Overview of AWS IoT FleetWise architecture for this Chalk Talk

Integration of the AWS IoT FleetWise Edge Agent into data logger

Provisioning and deploying a campaign to the data logger

Evaluation of campaign data

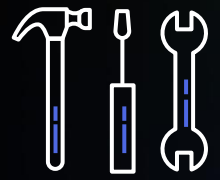
Call to action

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Accelerating product development



Ideate



Prototype



Develop



Manufacture



Operate

- Bringing processing power and connectivity to the edge
- Use existing tools and processes used in product development and early prototyping
- Prototype vehicles are often equipped with data loggers installed in-vehicle and connected to the vehicle electrical system's network connections
- We present how we integrated AWS IoT FleetWise in Intrepid Control System's neoVI RED 2, allowing their customers to use the same hardware for in-vehicle data logging, while also supporting the IoT capabilities that AWS IoT FleetWise brings to their platform

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Battery lifetime enhancement

A CUSTOMER USE CASE (RE-)USING EXISTING RESOURCES

"As a Product Manager for battery packs, I want to sideload my data collection campaign to ongoing engineering work, so that I get my data in quickly and at lowest possible cost, to allow for enhancing the lifetime of my product."

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Battery lifetime enhancement

A HYPOTHETICAL CUSTOMER USE CASE (RE-)USING EXISTING RESOURCES

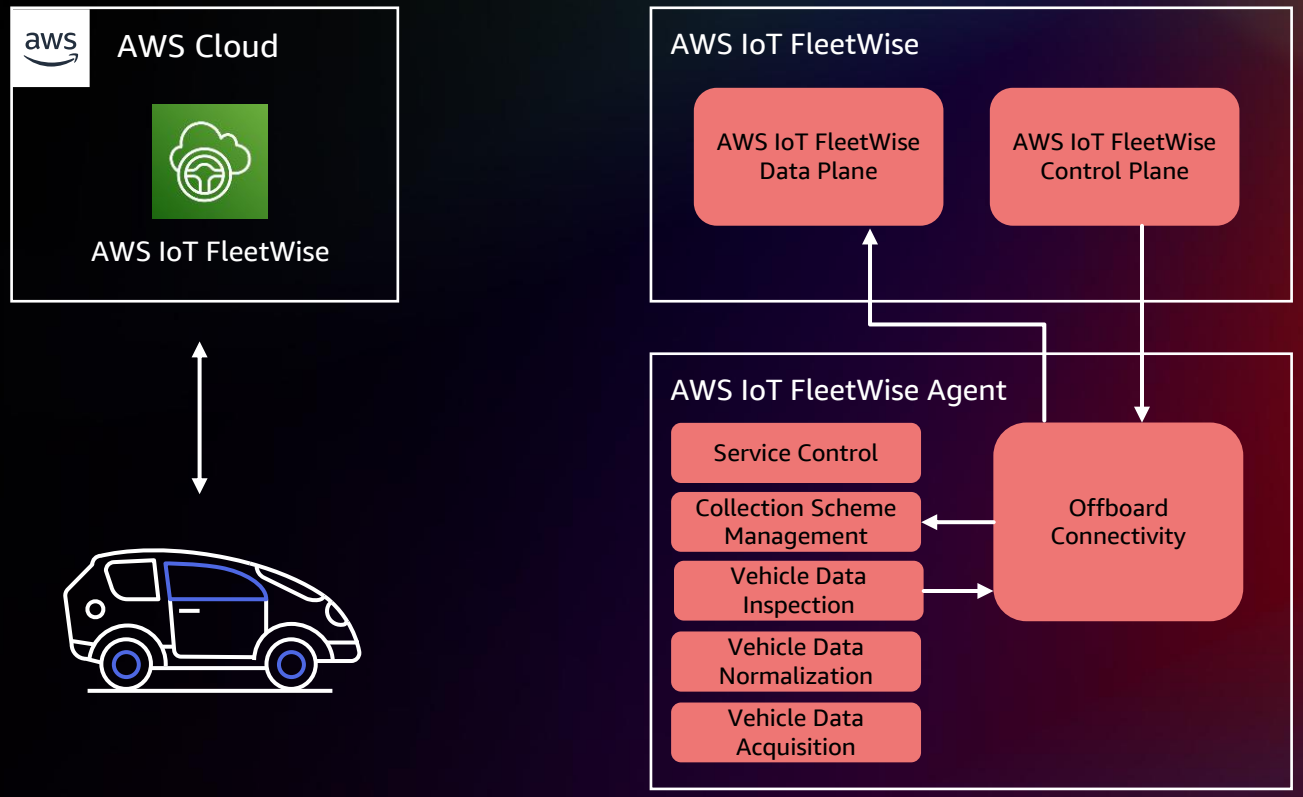
- Need to proof a hypothetical relationship between temperature, load profile, and accelerated degradation
- Engineering fleet on calibration field trip equipped with AWS IoT FleetWise–enabled Intrepid neoVI RED 2 logger
- Team designs and deploys campaign remotely
- Data collection starts with no interference

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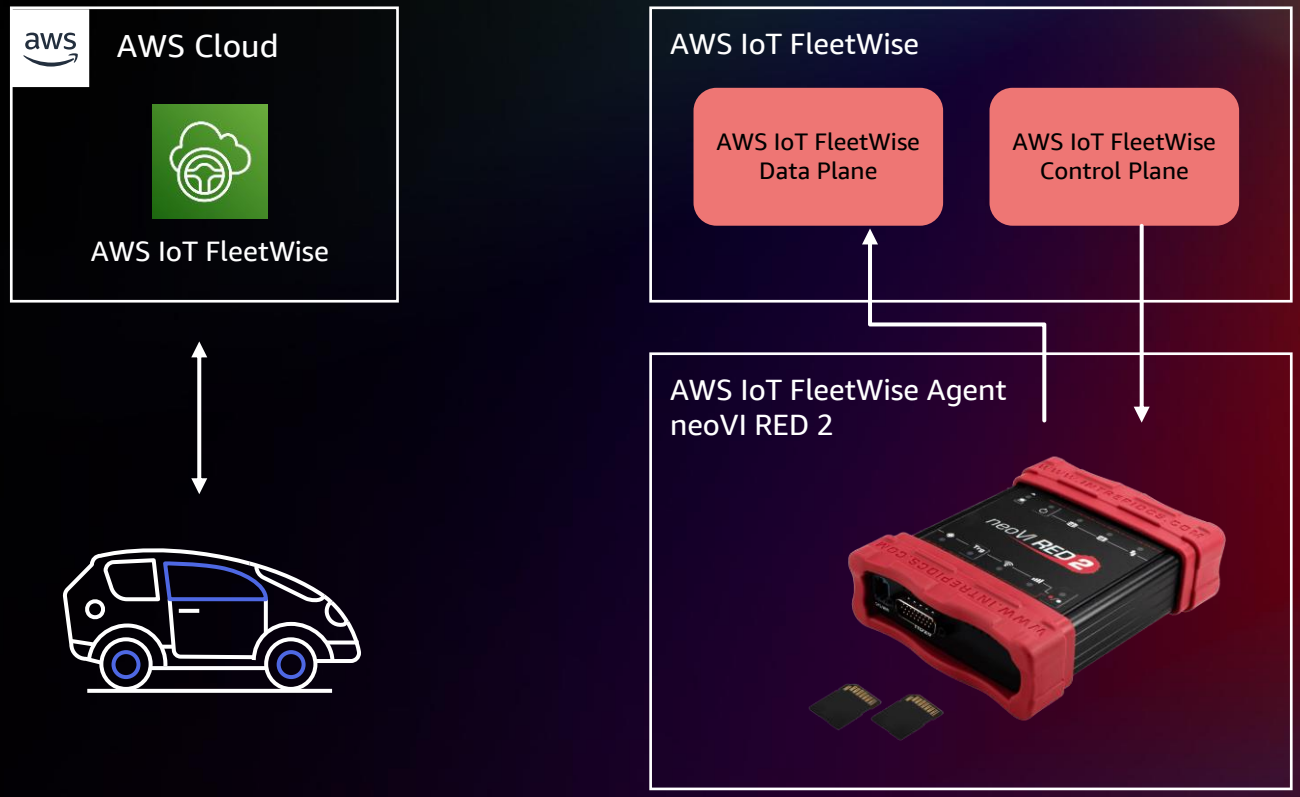
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AWS IoT FleetWise architecture



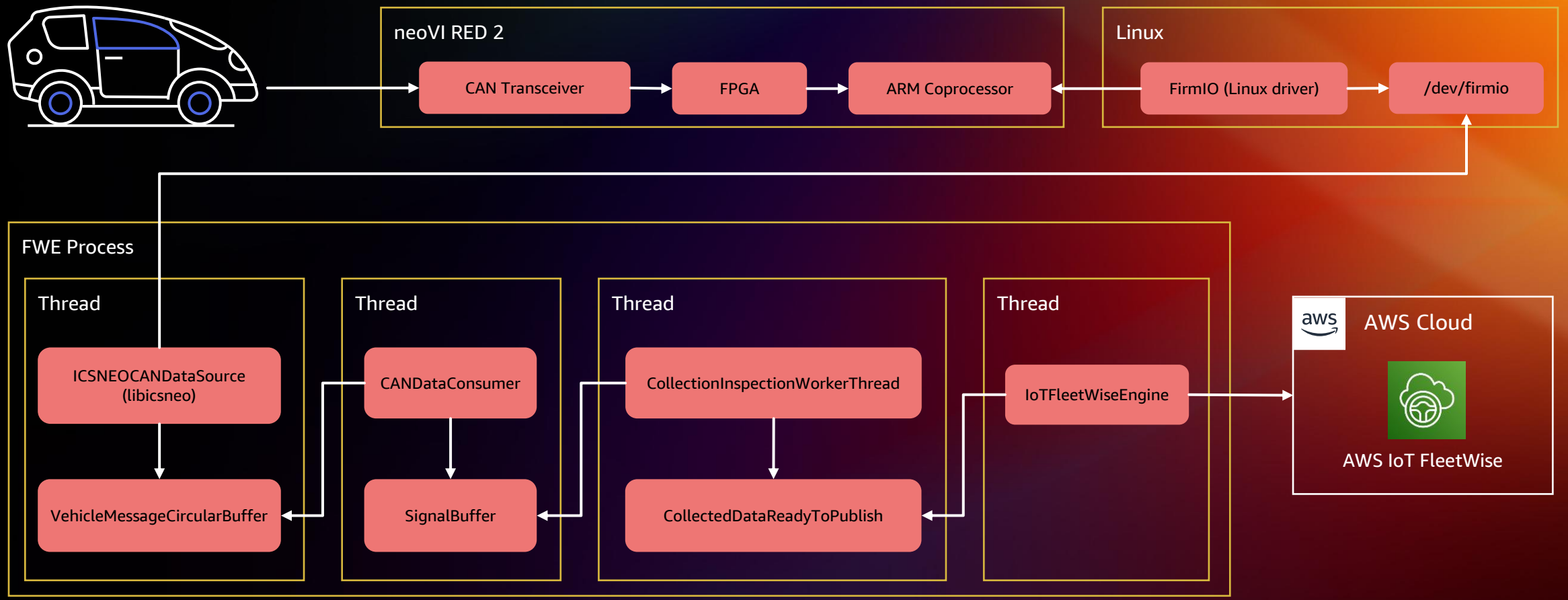
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AWS IoT FleetWise architecture



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AWS IoT FleetWise edge integration with neoVI RED 2



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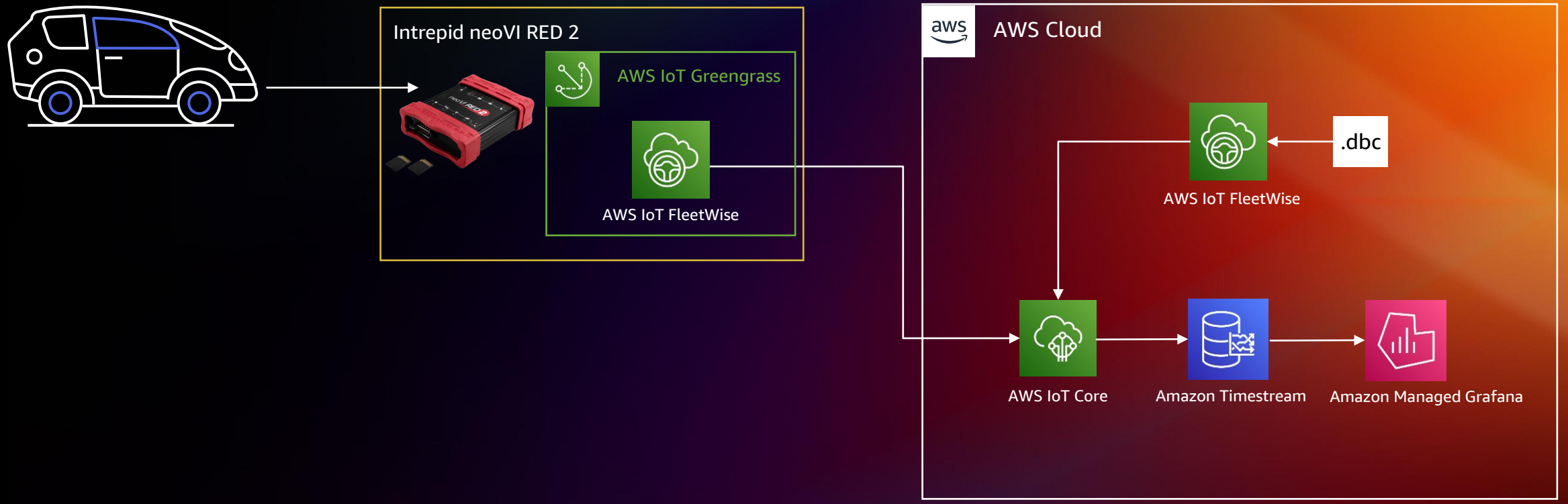
Adding FWE support to RED 2

- Created new AbstractVehicleDataSource, ICSNEOCANDataSource
- ICSNEOCANDataSource::doWork()
  - mDevice->getMessages()
  - Timestamp conversion (2007-01-01 ICS epoch, ns to ms)
  - Create VehicleDataMessage
  - mCircularBuffPtr->push(message)

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Cloud architecture interface to the device



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Evaluating the data using Grafana

Live demo on Grafana board



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The result

A REAL CUSTOMER USE CASE USING EXISTING RESOURCES

- Successfully sideloaded the data collection campaign to the calibration field trip
- Collected hours of relevant battery and vehicle dynamics data
- We were able to verify hypothesis and develop a changed throttle to torque demand mapping for colder temperatures resulting in 17% lower peak current
- No additional field trip needed, saving significant time, money, and resource blocking for other important work
- By integrating with Amazon machine learning and analytics tools, we accelerated the hypothesis verification as well as development of adapted algorithm

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Call to action

- We demonstrated how using AWS IoT FleetWise on industry data loggers can accelerate the early development of features and capabilities, by leveraging vehicles in their early prototyping phase
- By using data loggers with AWS IoT FleetWise that integrate into vehicle networks already, it offers an accelerated option to remotely access relevant data to inform product development
- Using data logging as a use case allows customers an opportunity to “shift-left” their verification and validation of AWS IoT FleetWise for their production fleet

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Thank you!

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