



Connected Data Solutions  
*Unifying Edge Systems with the  
Cloud*

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*May 25, 2023*

*Adapting a Standardized Pipeline to  
Interface the Cloud  
to Autosar ECUs  
(Classic and Adaptive)*

*- a case study using the  
standards of the eSync Alliance*



# eSync Alliance Background

([www.esyncalliance.org](http://www.esyncalliance.org))

- **Working Groups (established 2018)**

- MWG (Marketing)
- TWG (Technical)
- CWG (Conformance)

- **Liaisons**

- COVESA (topic: VSS)
- Autoware (topic: eSync containers)

Note: informal cooperation with Autosar





**eSync Alliance Program**  
A multi-company initiative for OTA updates and diagnostics



OEMs



Tier 1s



Tier 2s



Cloud Services



# eSync Showcased / Demonstrated at CES 2023

1) Aptiv Building

2) AWS Booth

3) COVESA Event

4) Excelfore Suite

5) Foxconn MIH Booth

6) Green Hills Booth

7) GuardKnox Suite

8) PlusAI Booth

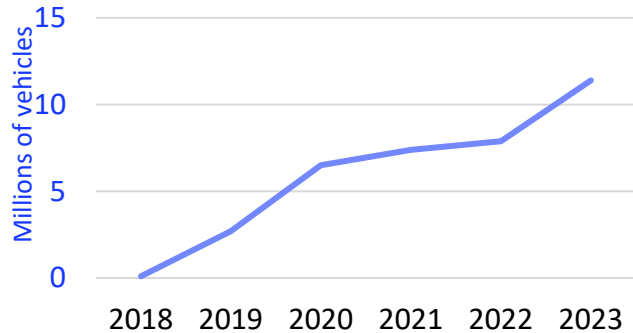
9) VinFast Booth

10) Wind River Demo (Aptiv Bldg)

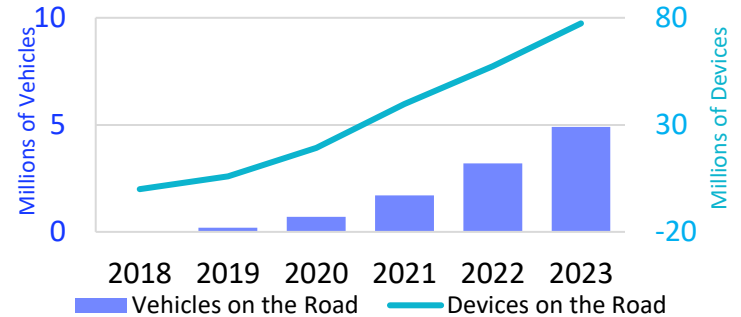


# Commercial Deployments of eSync

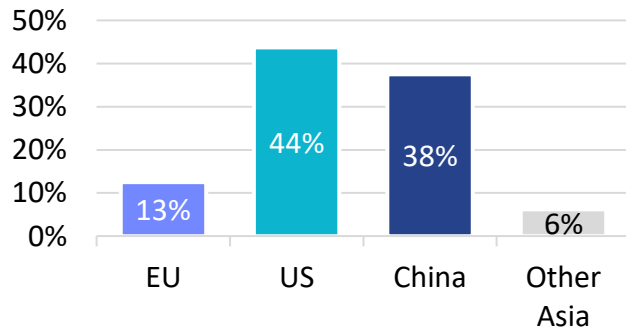
### Vehicles in Programs



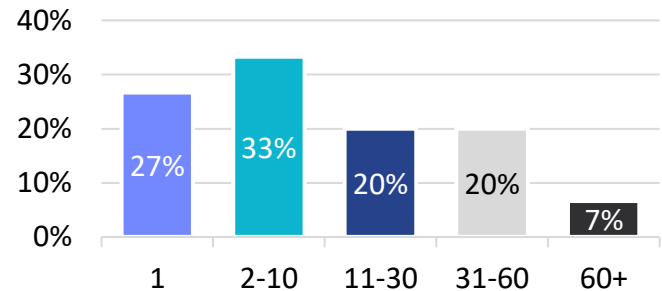
### Vehicles and Devices on the Road



### Program Distribution: by OEM Region



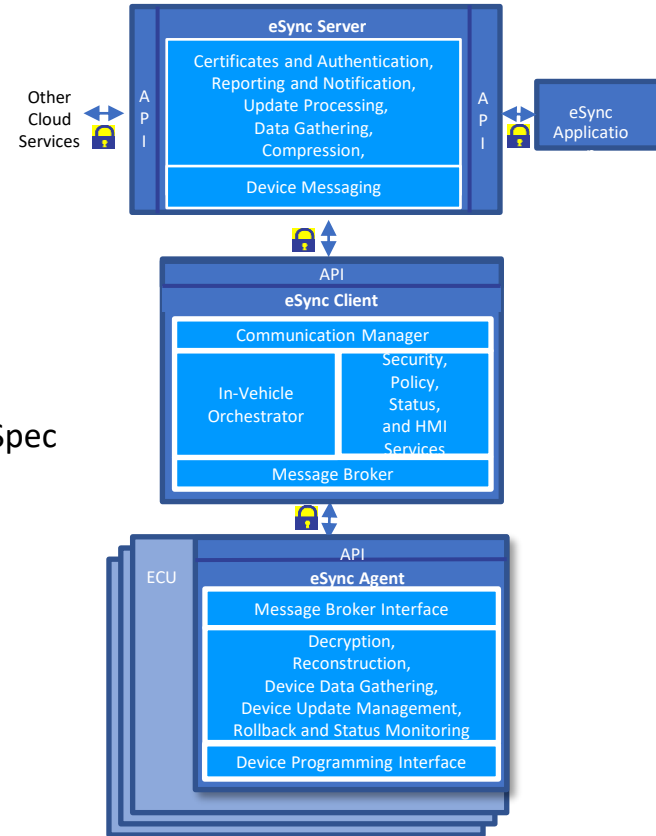
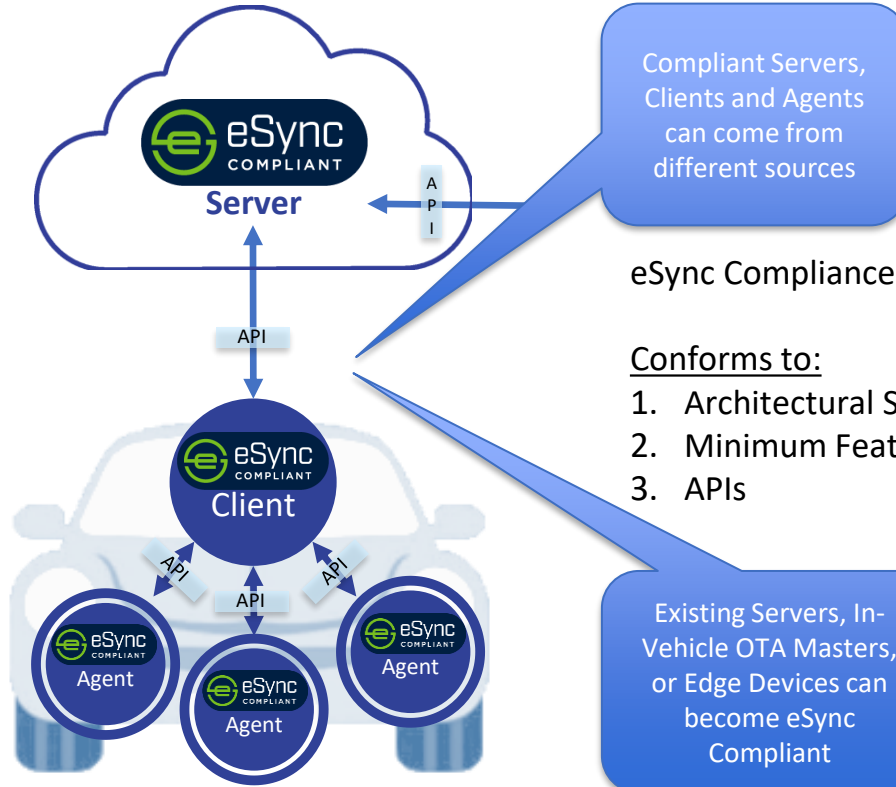
### Program Distribution: number of Connected In-Vehicle Devices



# eSync Alliance Architecture

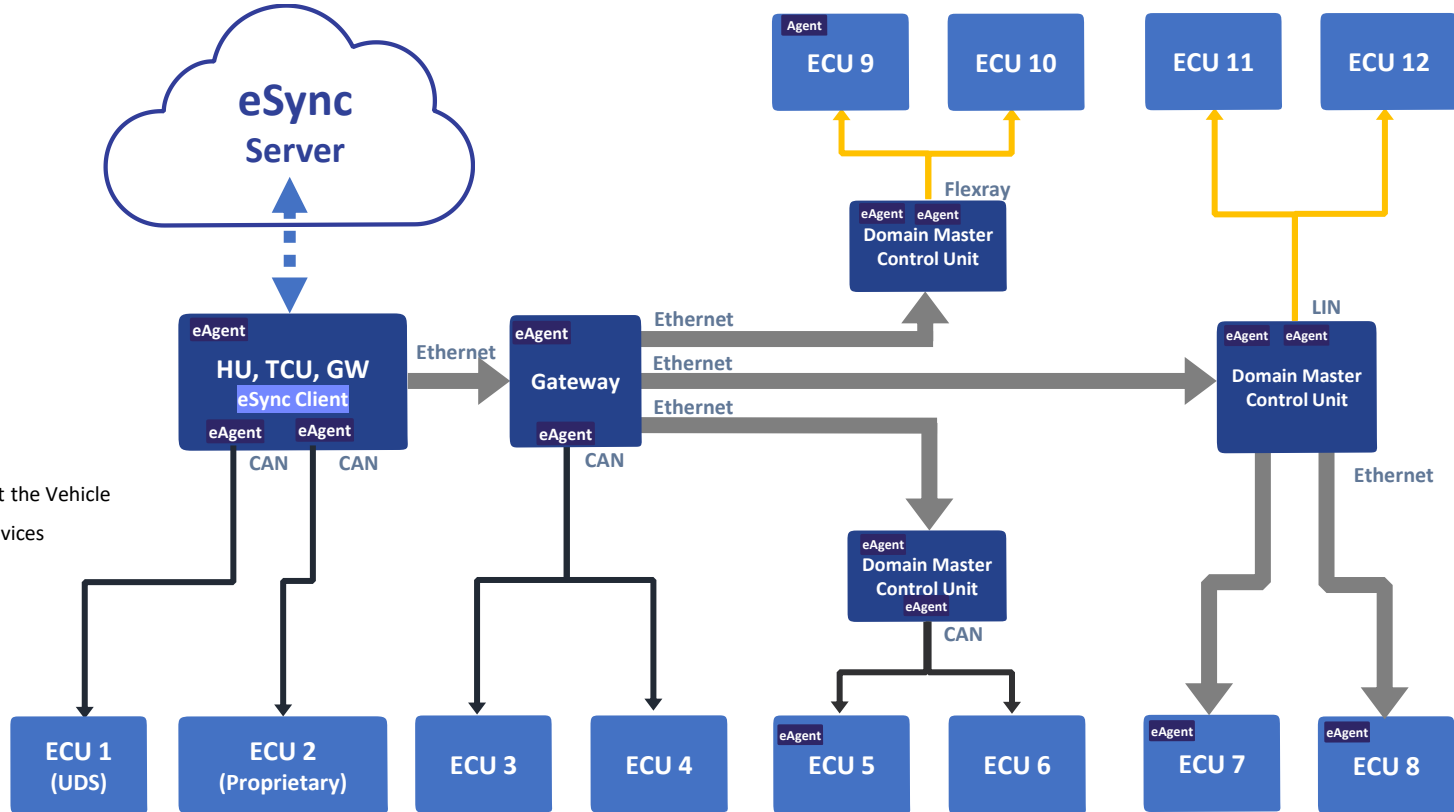
[www.esyncalliance.org](http://www.esyncalliance.org)

# eSync: Interoperable Spec for a Bi-Directional Data Pipeline



# Flexible and Scalable In-Vehicle Environment

Agents Distributed Throughout the Car

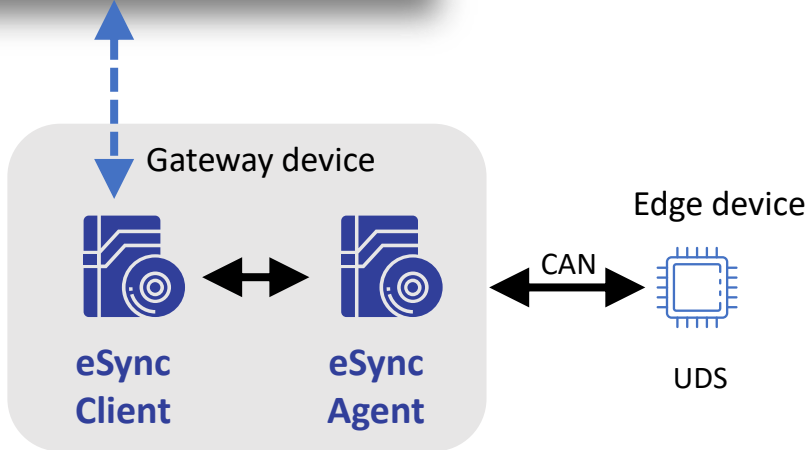
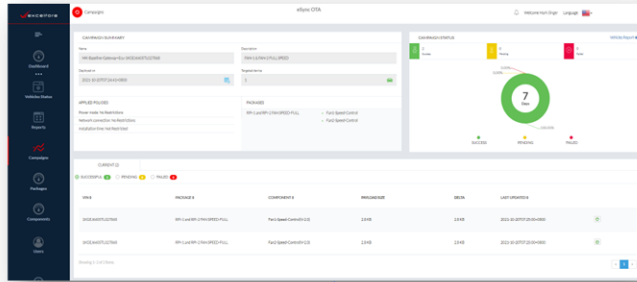


## eSync Agents:

- Distributed Throughout the Vehicle
- Written to the Edge Devices



# Working Automotive OTA ... Out-of-the-Box



## eSync Agent SDK

### eSync Server

Standard OTA campaign manager

Account on AWS

Hosted in the USA

### eSync Client

Software deliverable

For placement on Linux platform

### eSync Template Agent

Buildable with libraries

For placement on Linux platform

Configure programming I/F to  
your edge device

### Typical Uses

Familiarization with eSync OTA processes

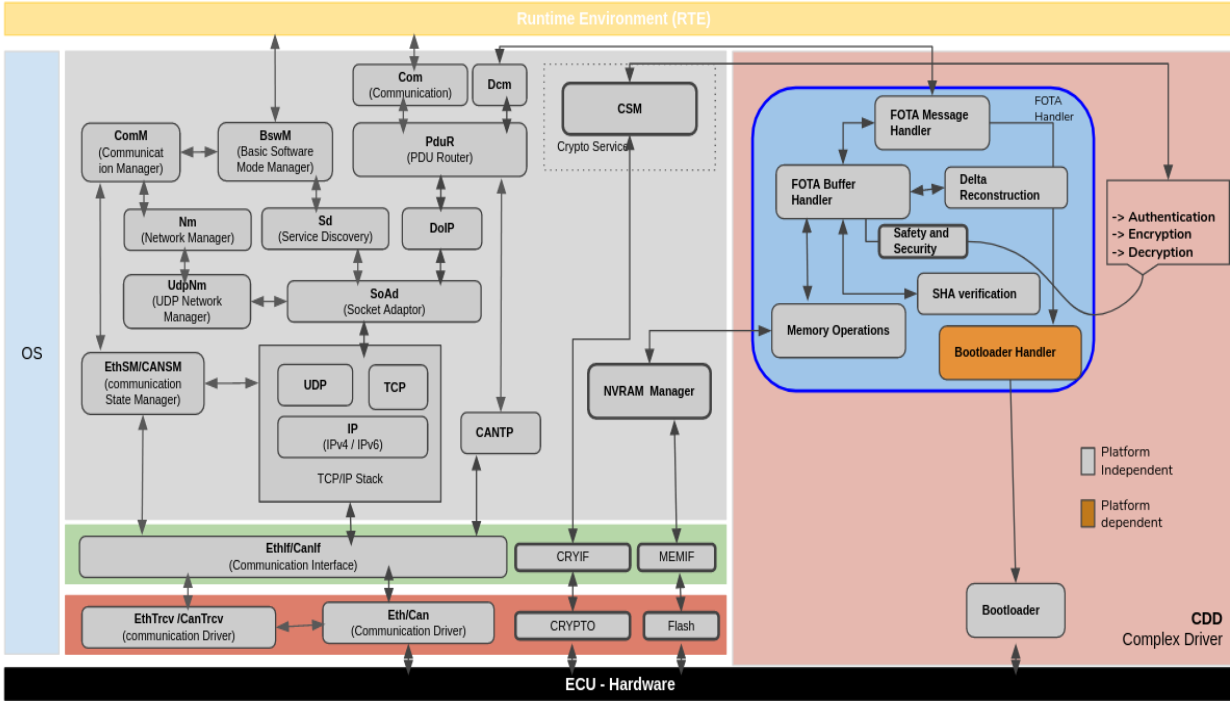
Development of agent for edge device

Demonstration of OTA on edge device

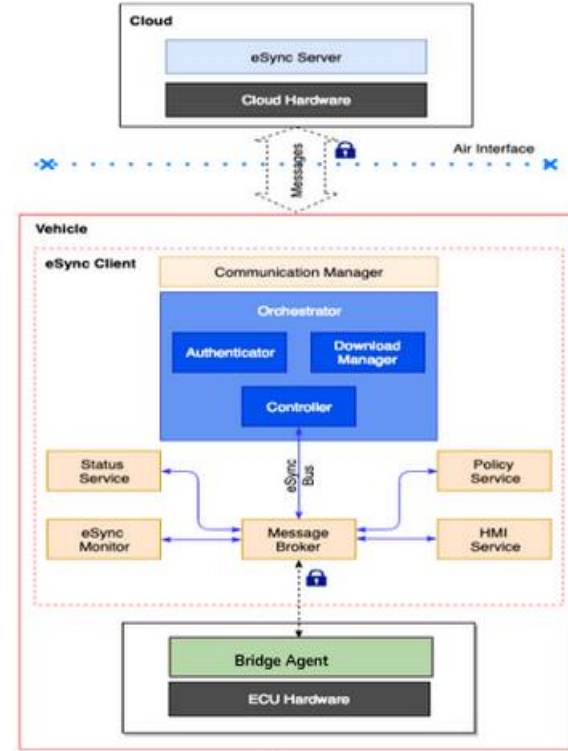
# Application of eSync to AUTOSAR

# AutoSAR Classic (Fota Client)

## Classic Autosar



## eSync components

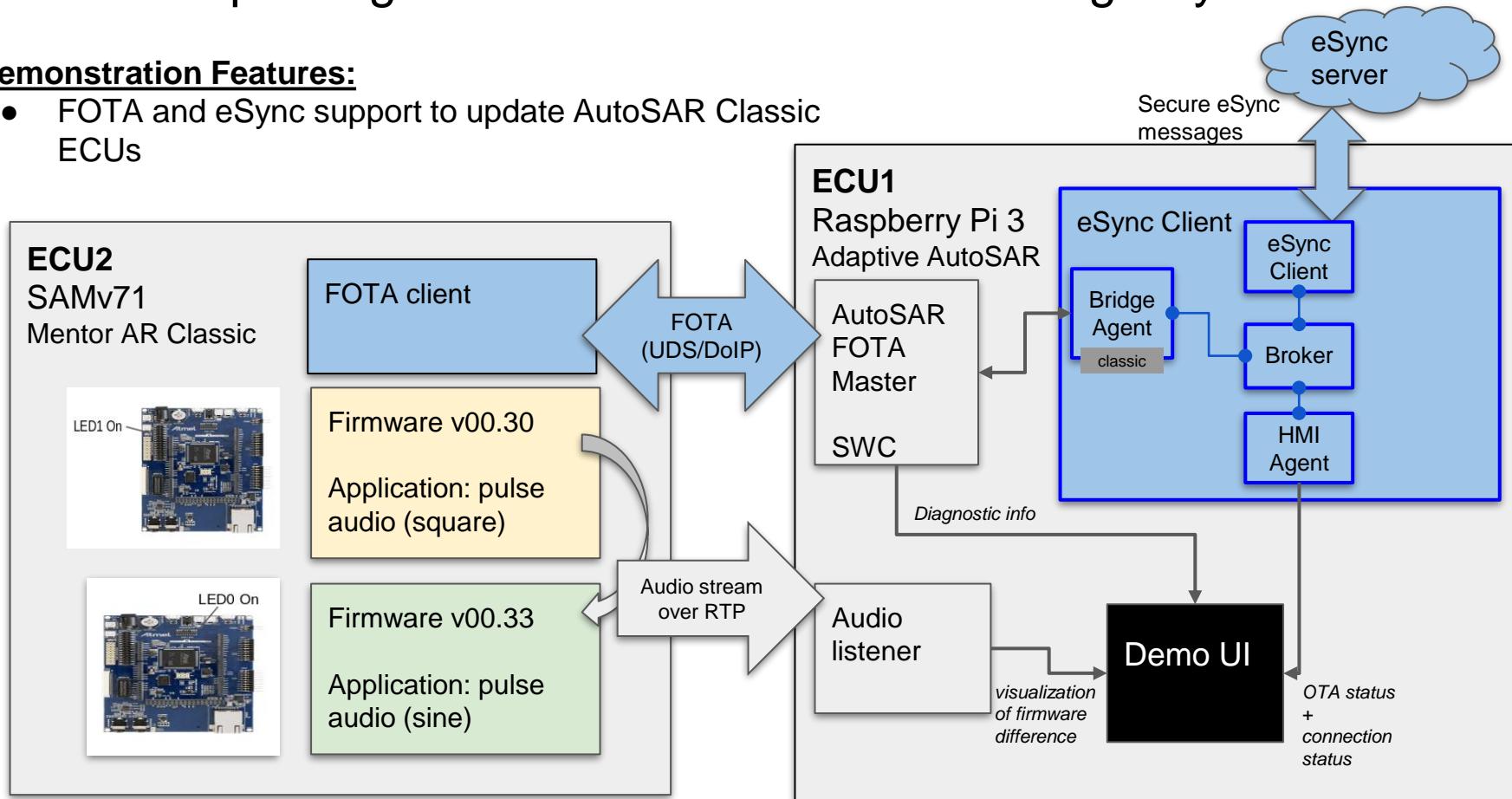


Ethernet

# Demo 1 - Updating AUTOSAR Classic ECUs using eSync

## Demonstration Features:

- FOTA and eSync support to update AutoSAR Classic ECUs



# Demo 1 Overview : Update Classic Autosar ECU

## Audio Source (RTP talker)

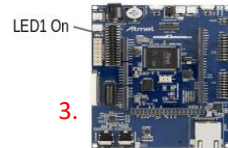
SAMv71 MicroController

Classic AutoSAR (Mentor VSTAR)

**Version:  
00.00.30**



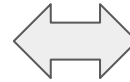
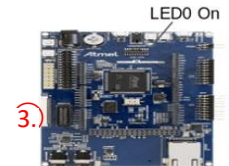
- ① FW Version : 00.00.30
- ② Audio Wave : Square
- ③ LED1 On



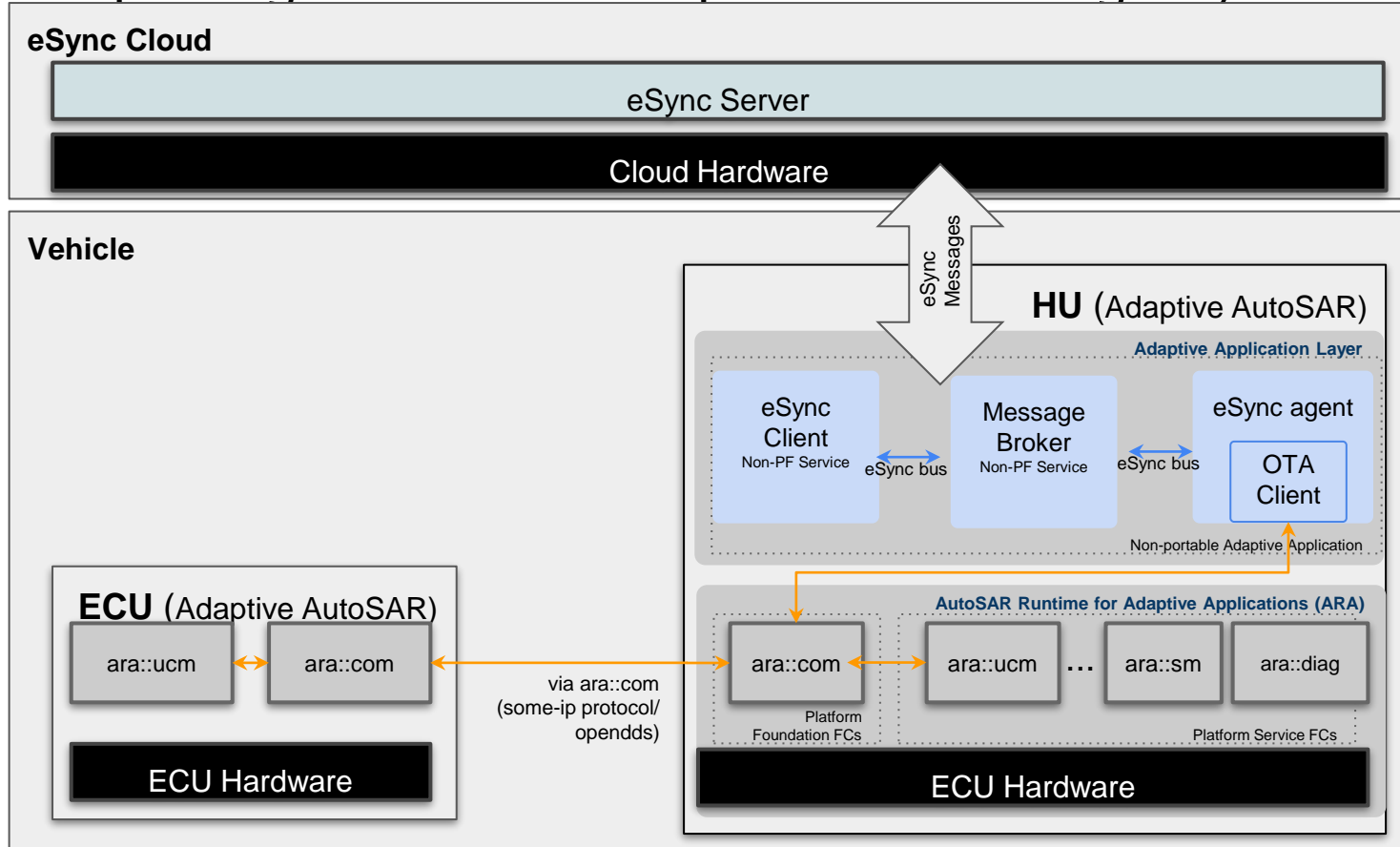
**Version:  
00.00.33**



- ① FW Version : 00.00.33
- ② Audio Wave : Sine
- ③ LED0 On



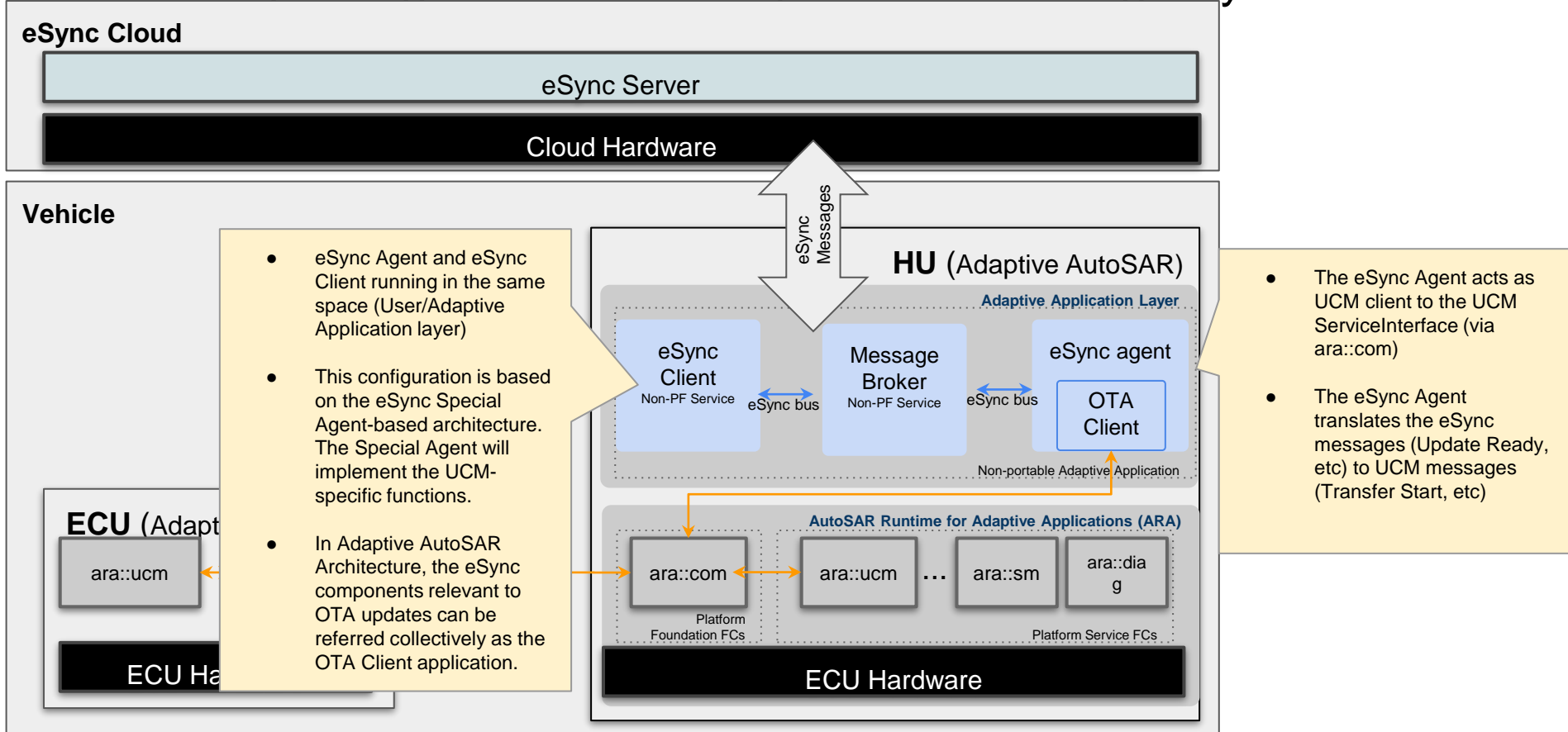
# Demo 2 - Updating AUTOSAR Adaptive ECUs using eSync



## Configuration:

Client and Agent on HU (Adaptive AutoSAR) , UCM subordinate on ECU (Adaptive AutoSAR)

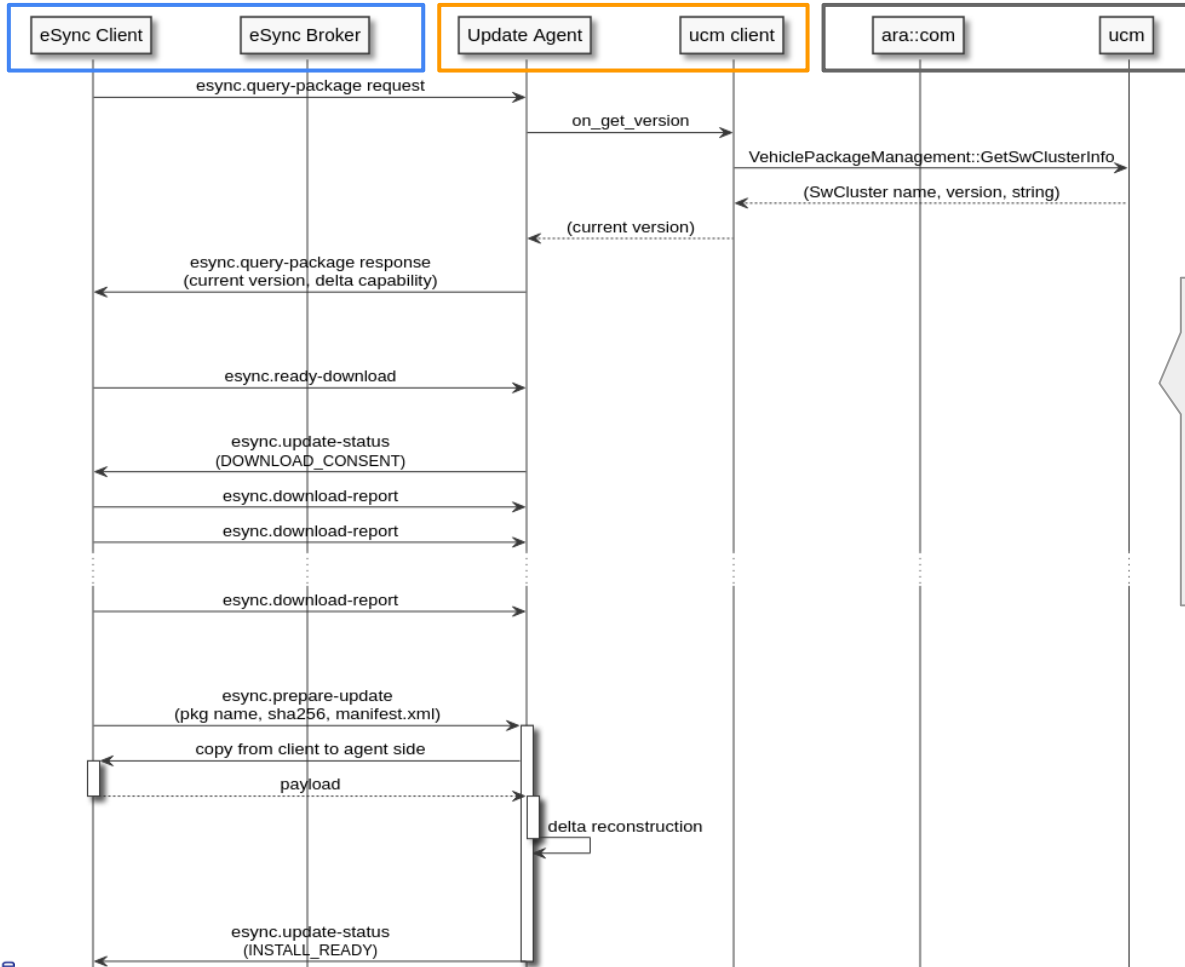
# Demo 2 - Updating AUTOSAR Adaptive ECUs using eSync



- eSync Agent and eSync Client running in the same space (User/Adaptive Application layer)
- This configuration is based on the eSync Special Agent-based architecture. The Special Agent will implement the UCM-specific functions.
- In Adaptive AutoSAR Architecture, the eSync components relevant to OTA updates can be referred collectively as the OTA Client application.

- The eSync Agent acts as UCM client to the UCM ServiceInterface (via ara::com)
- The eSync Agent translates the eSync messages (Update Ready, etc) to UCM messages (Transfer Start, etc)

# eSync on Adaptive AutoSAR Platform - Update Sequence (1/2)

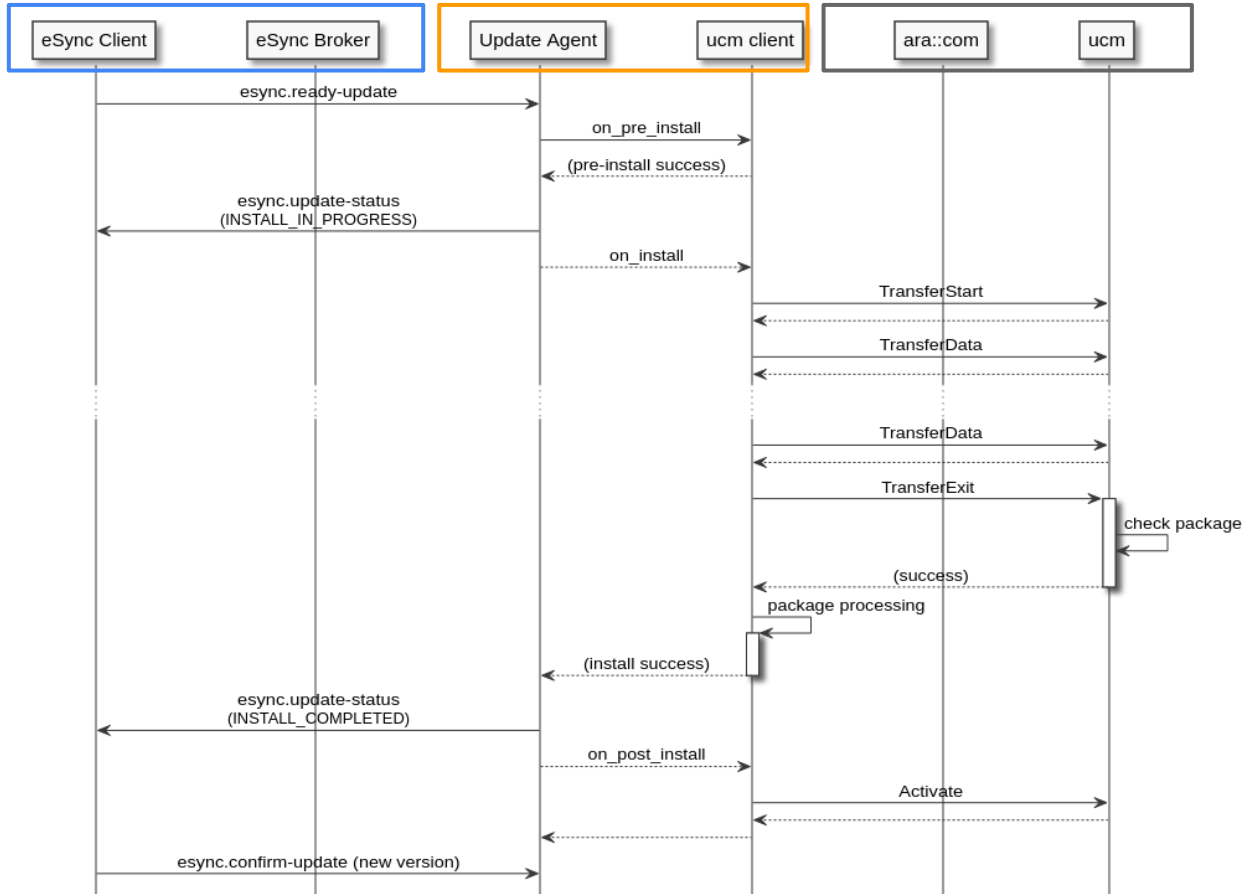


- The OTA/UCM Client includes Update Agent and UCM client actors
- The OTA/UCM Client translates the eSync messages (Update Ready, etc) to UCM messages (Transfer Start, etc)

Ref: White Paper



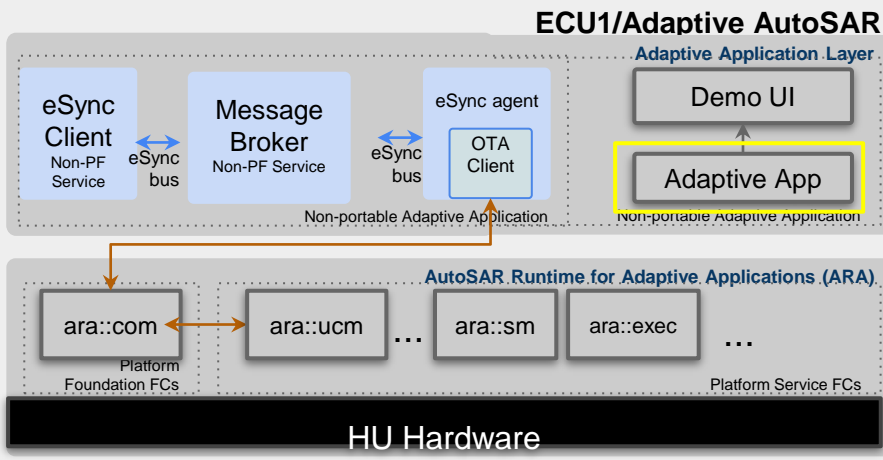
# eSync on Adaptive AutoSAR Platform - Update Sequence (2/2)



# Demo 2 Overview : Update ECU1 (Adaptive AutoSAR)

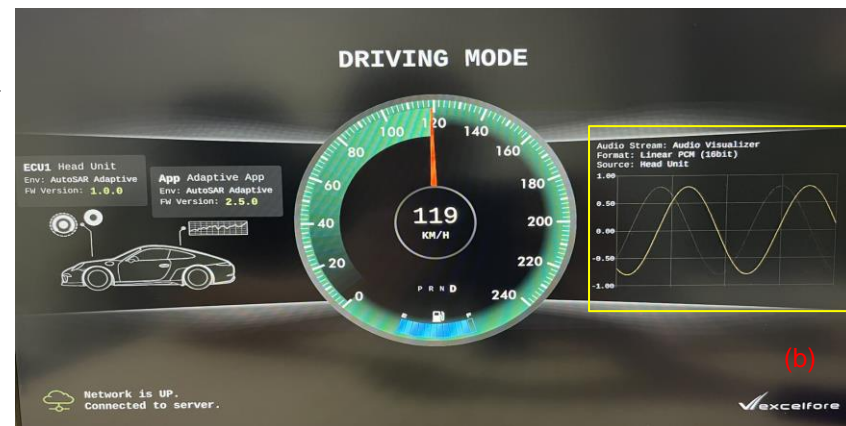
## ECU1 : Audio Source Adaptive App (audio source)

Raspberry Pi 3  
Adaptive AutoSAR



(a) SW version 1.1.2

(b) Adaptive app sends audio source as a noise wave



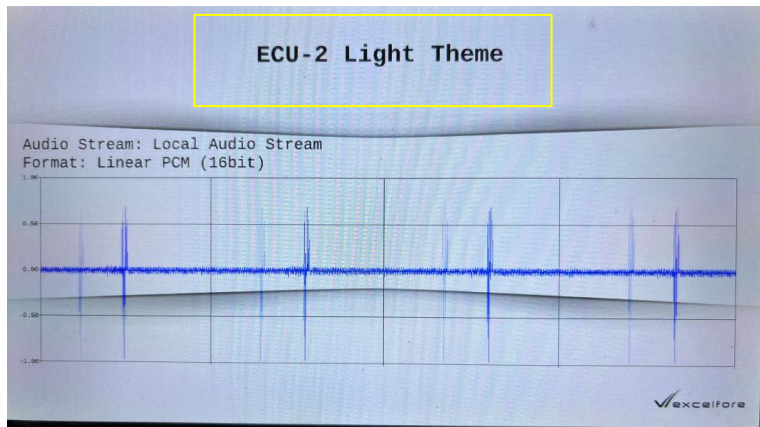
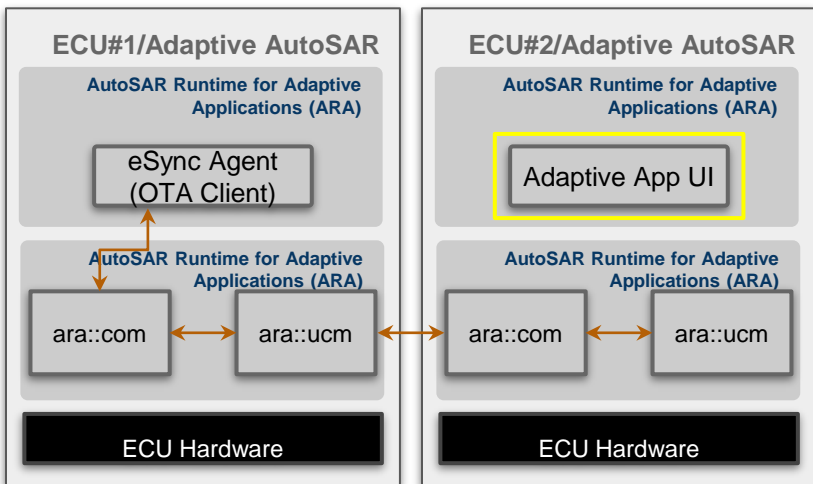
(a) SW version 1.2.1

(b) Adaptive app sends audio source as a Sine wave

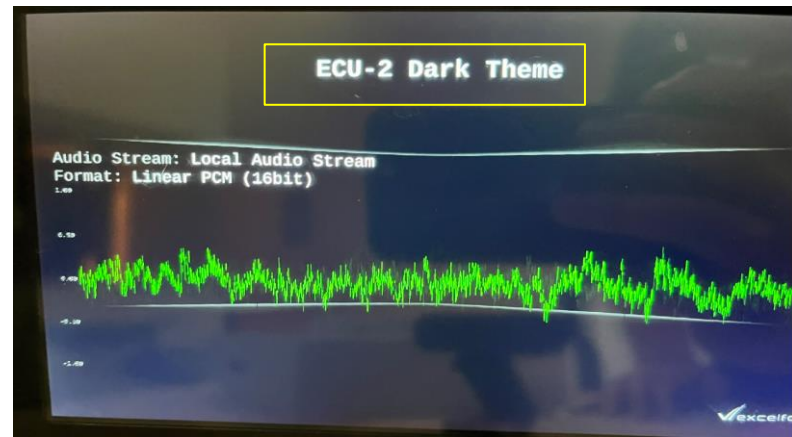
# Demo 2 Overview : Update ECU2 (Adaptive AutoSAR)

## ECU2 : UI Adaptive App (UI theme display)

Raspberry Pi 3  
Adaptive AutoSAR



- (a) SW version 2.1.1
- (b) Adaptive app UI is using light theme



- (a) SW version 2.2.1
- (b) Adaptive app UI is using dark theme

# Relevant Links

- Whitepapers
  - [Updating AUTOSAR Classic ECUs using eSync](#)
  - [Updating AUTOSAR Adaptive ECUs using eSync](#)
- Demo Videos



Demo 1 Video: Updating Classic ECUs  
Link: <https://youtu.be/jYbgY793kpg>



Demo 2 Video: Updating Adaptive ECUs  
Link: <https://youtu.be/-ZNqRtudP5E>





Connected Data Solutions  
*Unifying Edge Systems with the  
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*Thank You*

