Building a Standardized Data Pipeline from the Cloud to All Devices in the Vehicle

The eSync Alliance presents a working model for a single secure data pipeline to reach ECUs and smart sensors throughout the connected vehicle.
eSync Alliance Work Groups

Technical Work Group:
Chair: Steffen Herz, Hella
Co-Chair: Shivangee Bapat, AlpsAlpine

- Compliance/Interop Specifications
- Technical Documentation
- Compliance Testing Program
- Test Tool Development
- Developer’s Guide, SDK, Reference Implementation
- Technology Roadmap
- Liaison Technical Activities
- Plugfest Management
- Management of Test Houses
- Liaison Technical Activities

Marketing Work Group:
Chair: Mark Singer, Excelfore
Co-Chair: Anja-Maria Hastenrath, EmbeddedPR

- MarCom:
  Public Relations
  Website, Social Media
  Logos, Trademarks, Usage and Style guides
  Whitepapers, Brochures and Other Collateral
  Tradeshows, Demos and Events
  Management of MarCom Agencies
- Management of Logo Compliance Program
- Member Recruitment
- Liaison Marketing Activities
- Market Requirement Documents:
  Compliance/Interop
  Test Tools, SDK, Reference System
  Demo System
  Feature/Technical Extension and Roadmap
Challenges of Automotive OTA

Many Technology Providers

First Generation Automotive OTA
Focused on IVI

Most Software Recall Costs are Powertrain/Safety Components

Great Variety of Devices, Processing Resources, OSs, Networks

Too Many Proprietary OTA Approaches – Complexity and Costs are Exploding

Multiple Large Automakers
An Open Multi-Company Initiative to Standardize on a Common Platform for Automotive OTA Updates and Data Gathering
Understanding eSync

Compliant Servers, Clients and Agents can come from different sources

eSync Compliance
Conforms to:
1. Architectural Spec
2. APIs
3. Feature Spec

Existing Servers, Orchestrators or Devices can become eSync Compliant
# eSync Current Deployment Metrics

## eSync Adoption

<table>
<thead>
<tr>
<th>Metric</th>
<th>By end of 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automakers in Production</td>
<td>5</td>
</tr>
<tr>
<td>Max Models per Automaker</td>
<td>3</td>
</tr>
<tr>
<td>Vehicles Produced</td>
<td>1+ Million</td>
</tr>
<tr>
<td>Vehicles under Contract</td>
<td>10 Million</td>
</tr>
</tbody>
</table>

## In-Vehicle Complexity

<table>
<thead>
<tr>
<th>Metric</th>
<th>By end of 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Number of Edge Devices</td>
<td>&gt; 60 Devices</td>
</tr>
<tr>
<td>Max Number of Technical Domains</td>
<td>7 Domains</td>
</tr>
<tr>
<td>Mix of Operating Systems</td>
<td>12 Operating Systems</td>
</tr>
<tr>
<td>Networks / Protocols</td>
<td>4 Networks / Busses</td>
</tr>
</tbody>
</table>
Key Items in the Demonstration Platform:

- **Excelfore Server Software**
- **Molex Telematics Gateway**: Linux, on Cellular
- **Alpine Head Unit**: Android and QNX VMs, on Ethernet
- **ZF Airbag Controller**: AUTOSAR CP on fast CAN
- **Hella Body Controller**: AUTOSAR CP on slow CAN
Understanding eSync Data Gathering

- Data Gathering Configuration
- Real Time Data

- Real Time Operating Data
  - Not Just Error Codes
- Configurable Data Gathering
Building a Data Platform with the eSync Compliant Data Pipeline

Cloud Components

In-Vehicle Components

Data Pipeline

Data Aggregation
Building a Data Platform with the eSync Compliant Data Pipeline

Cloud Components

Install:
- Diagnostic Script

Web App

eSync Compliant Server

eSync Compliant Client

TCU / Gateway

Local Storage

Data Service

Data Management

Data Pipeline

In-Vehicle Components

Components

Upload:
- Software Component

Install:
- Diagnostic Script

Activate

Data Aggregation

Agent

ECU

HPC

Sensor
Building a Data Platform with the eSync Compliant Data Pipeline

- Cloud Components
- In-Vehicle Components

**Edge Device**
- Ethernet
- CAN, Flexray, USB
- eSync Compliant Server
  - Web App
  - eSync Compliant Client
    - Orchestrator
      - Authenticator
      - Download Manager
    - Agent
      - Message Broker Interface
      - Encrypt/Decrypt
      - Delta Reconstruct
      - Policy
      - Update Controller
      - Device Programming Interface
    - Status Service
    - Message Broker
    - Policy Service
    - Monitor
    - HMI Service

**Data Service**
- Local Storage
- Data Storage

**Data Gathering**
- Rollback Mgmt
- Data Gathering
- Status Monitor

**HMI Service**
- Policy

**Web App**

**Communications Manager**

**Download Manager**
A Basis for Collaboration with Common Vehicle Interface Initiative
Why Work with eSync Alliance?

**eSync Compliant Bi-Directional Data Pipeline**

<table>
<thead>
<tr>
<th>Technology Advantages</th>
<th>Single Pipeline for OTA Updates and Data Gathering</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Proven to Cross OS and Bus Boundaries</td>
</tr>
<tr>
<td></td>
<td>Proven to Scale to Any Number of Devices in the Car</td>
</tr>
<tr>
<td>Timeliness Advantages</td>
<td>The Data Pipeline is Ready – eSync Spec is Practical, Complete, and Proven</td>
</tr>
<tr>
<td></td>
<td>Flexible, Consistent and Re-Usable Across Multiple Automakers and Use Cases</td>
</tr>
<tr>
<td></td>
<td>Tier-1s Already Integrating eSync Agents for their Devices</td>
</tr>
<tr>
<td>Liaison Advantages</td>
<td>Focus on Core Purpose while Leveraging an Existing Pipeline</td>
</tr>
<tr>
<td></td>
<td>Contribute to the Evolution of the Pipeline</td>
</tr>
<tr>
<td></td>
<td>Shared Members are Already Participating in Various Parts of the eSync Pipeline</td>
</tr>
</tbody>
</table>
For more information

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esyncAlliance.org