

Let Eclipse Chariott Massage You While Driving

SDV Community Day Lisbon – March 2023

Dr.-Ing. Sören Frey



Mercedes-Benz Tech Innovation



We shape the digital future of Mercedes-Benz

We are professional software engineers, product-oriented project managers, strategic partners, creative visionaries, reliable initiators, change enablers and tech innovators.

We are a **proud part of the Mercedes-Benz family.**

As a wholly owned subsidiary, we develop technological innovations, digital products and advanced software solutions exclusively for Mercedes-Benz. We drive the transformation towards "100% digital" while setting new standards in the context of car connectivity and the digitalization of vehicles and sales.

Background: Scrutinizing SDV Technologies in a Lab Environment

- Mercedes-Benz needed a test platform for validating various SDV technologies
- Example functionalities of interest:
 - Addition of new services after vehicle purchase
 - Dynamic re-allocation of software components to in-vehicle hardware
 - OTA
- Make those functionalities and SDV technologies come alive
- Early 2022: Searching for a representative example scenario





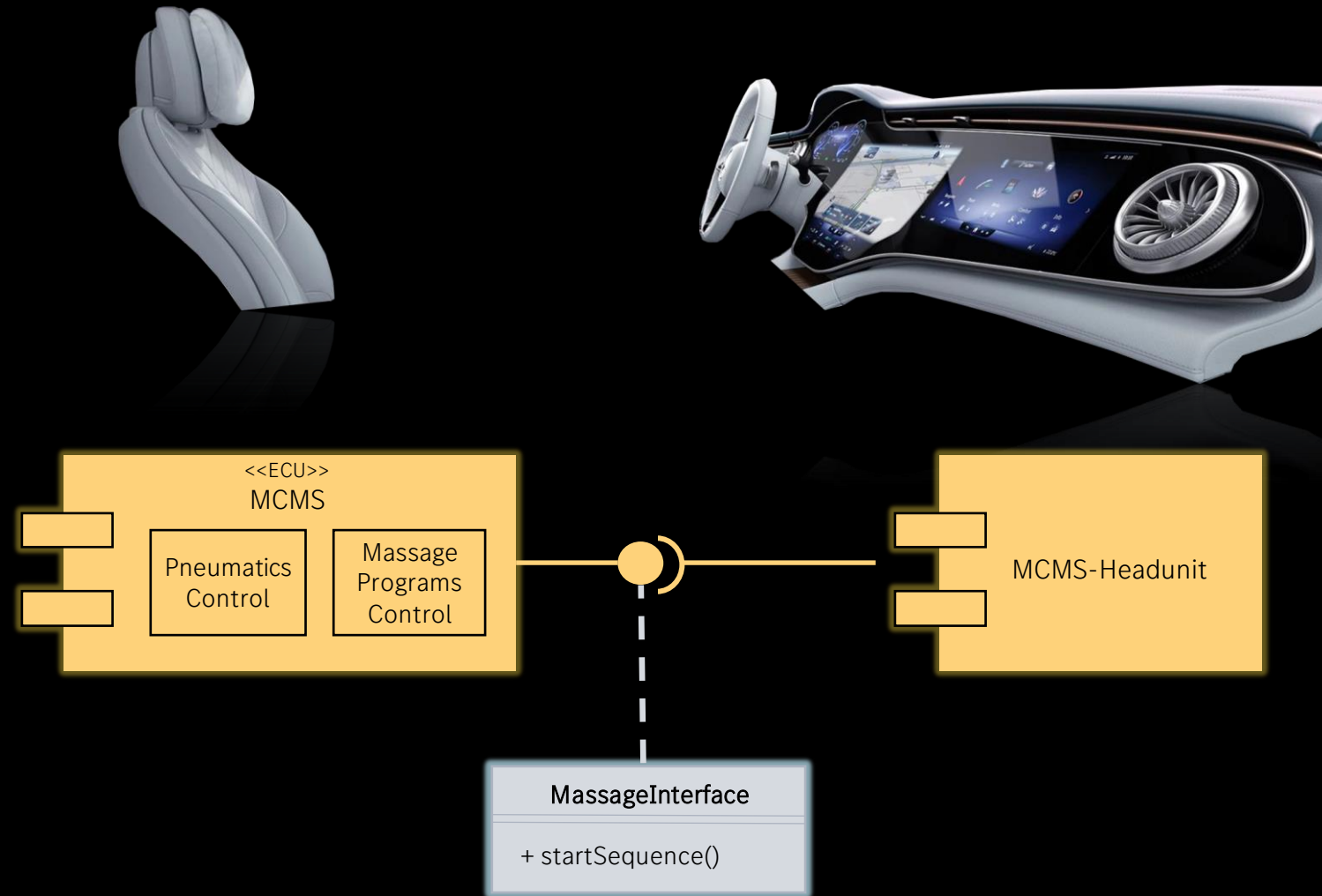
Predefined Message Programs

- Multi contour seats come with adjustable integrated air chambers
- The dynamically inflatable air chambers can produce a massage function in different intensities
- Predefined message programs define temporal and spatial sequences of air chamber inflation
- Some programs offer an additional warming effect (“hot stone massage”)



High-Level Status Quo Architecture Multi Contour Massage Seat (MCMS)

- The frontend (GUI) runs on the headunit and allows the driver to adjust the massage
- The MCMS is controlled by an ECU
- Compressed air is distributed to air chambers by Pneumatics Control
- The massage programs cannot be changed without flashing a seat's ECU



The Power of Decoupling Software and Hardware



Extraction of
massage control
logic from ECUs

Introduction of
seat APIs

New use cases

Buy
Massage

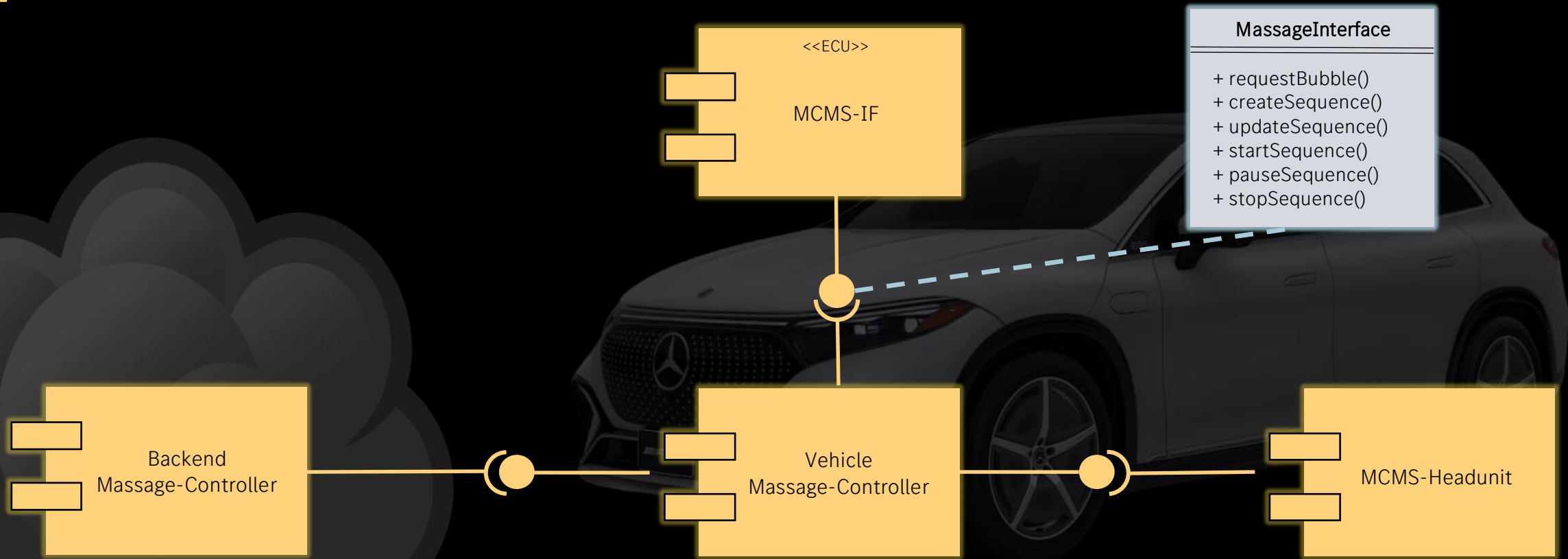
Create
Massage

Dynamic
Massage

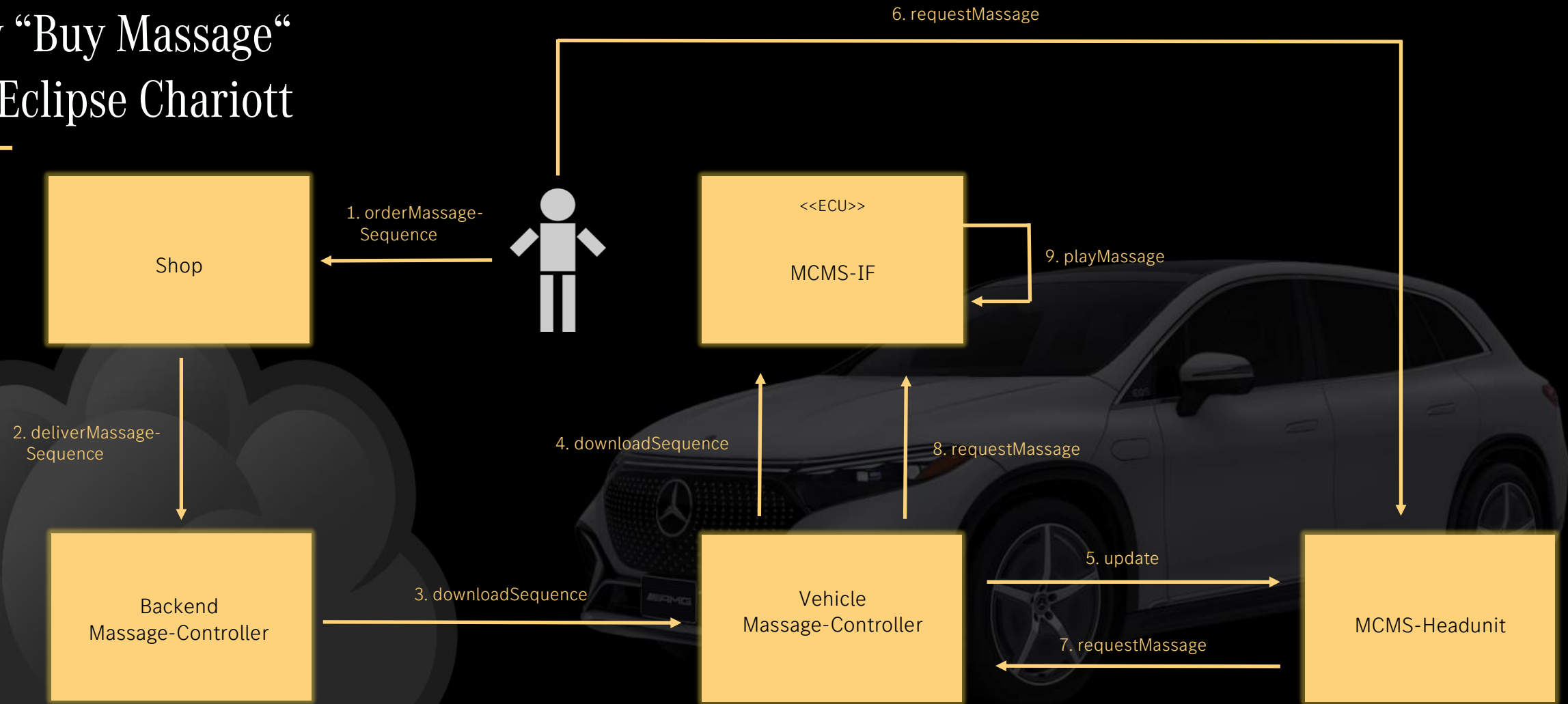
...

PoC Extended High-Level Architecture

Pre-Eclipse Chariott



Flow “Buy Message” Pre-Eclipse Chariott



Evaluation of SDV Technologies

Techniques for Upgradeable Cars

- Enable continuous updates and upgrades of software functions
- Enable seamless relocation of functionality between vehicles and clouds
- Adopt developer-friendly tools and technologies

Chariott Opportunities

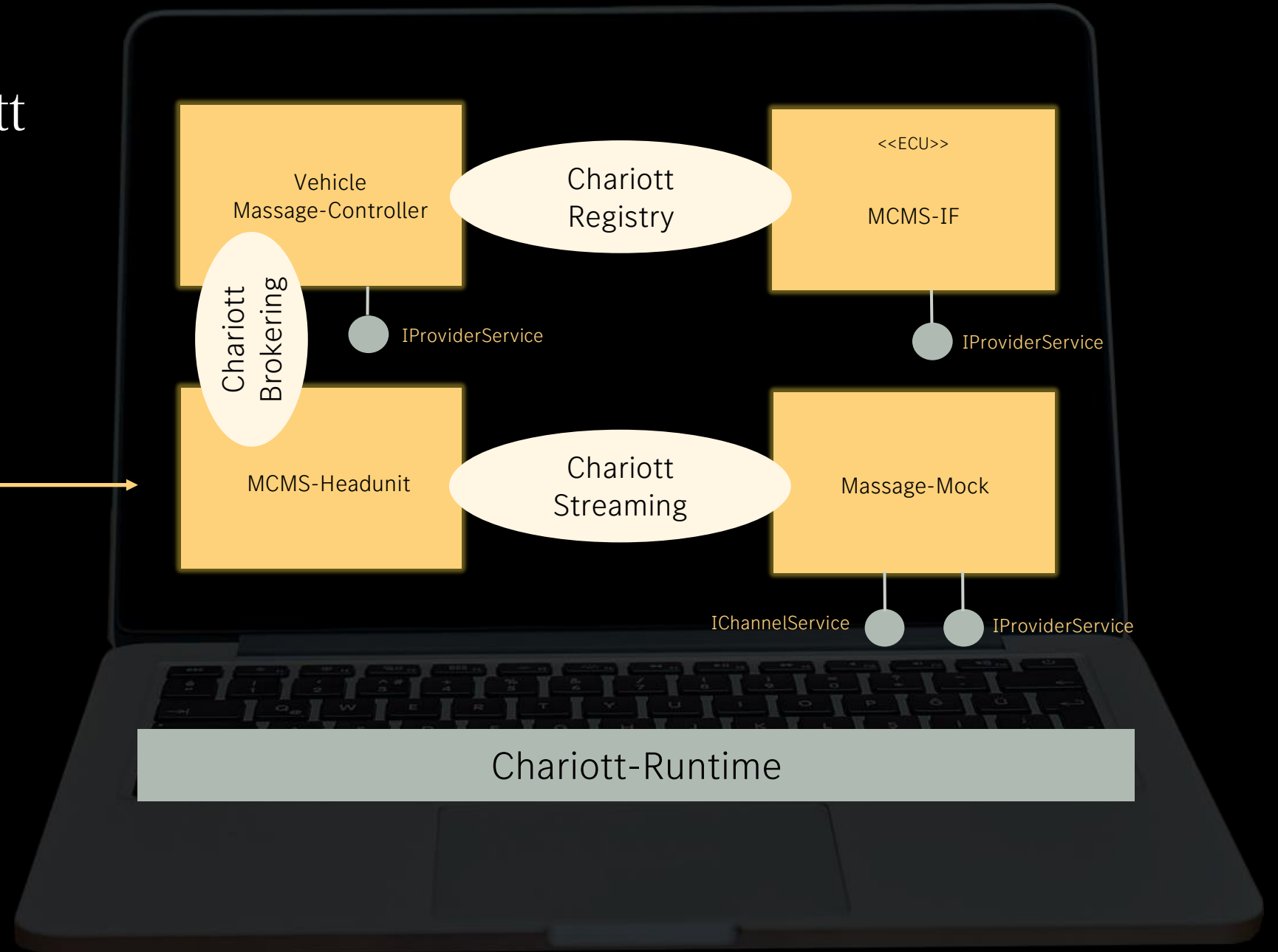
- Provide a service registry with lookup functionality
- Broker service-requests between providers and clients
- Provide event-streaming functionality

Evaluation Setup

Pre-Eclipse Chariott

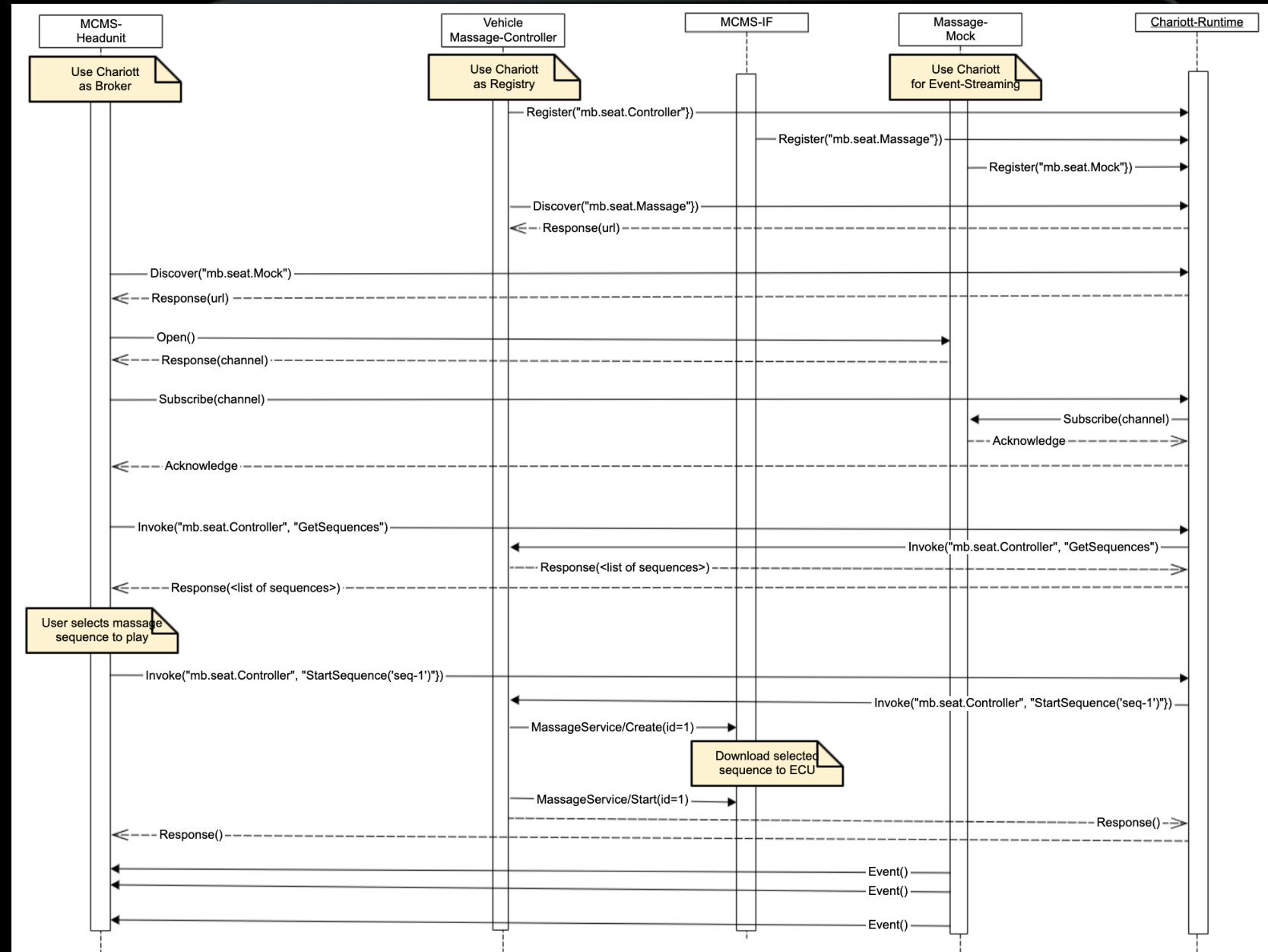


Evaluation Setup Architecture with Chariott

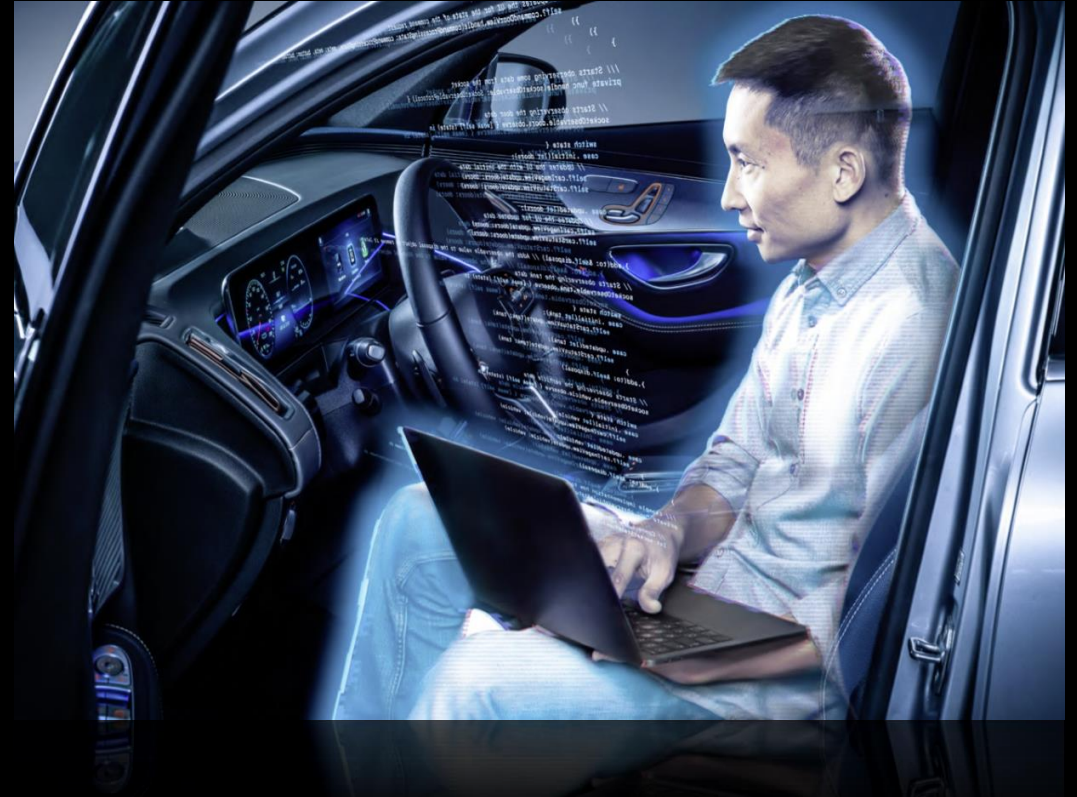


Evaluation Setup

Chariott in Action




Code Demo



Conclusion

- Mercedes-Benz investigates SDV technologies in a lab environment
- Multi contour massage seats are used as a representative example scenario
- Extraction of massage control logic from ECUs and the introduction of seat APIs enable new use cases
- Service registries are essential building blocks for decoupling in-vehicle SW components
- Eclipse Chariott has proven useful and was successfully integrated in the example scenario



The background of the slide features a repeating pattern of the Mercedes-Benz three-pointed star logo. The stars are arranged in a grid and vary in opacity, with some appearing as bright white highlights and others as faint grey shapes. A single star in the lower right quadrant is particularly bright, creating a lens flare effect.

Mercedes-Benz Tech Innovation GmbH
Wilhelm-Runge-Street 11, 89081 Ulm
Phone +49 731 505-06 / techinnovation@mercedes-benz.com / www.mercedes-benz-techinnovation.com
Domicile and Court Registry: Ulm / HRB-No.: 3844 / Management: Daniel Geisel (CEO), Isabelle Krautwald

Mercedes-Benz Tech Innovation

Backup

Flow “Dynamic Message” Pre-Eclipse Chariott

