Microsoft
Eclipse Foundation SDV 2nd Contribution Day
Eclipse Chariott Update

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Democratizing in-vehicle application development

Capability oriented model for App-to-App and App-to-Digital Twin Communications
IN THE LAST EPISODE
IN THIS EPISODE
Code Demo
Chariott – What Changed

In-Vehicle Applications

Dog Mode
Sample Application

Application Programming Model

In-Vehicle Digital Twin
(Project Ibeji)

In-Vehicle Digital Twin

Provider Registry

DogMode Logic

DogMode UI

Vehicle Integration Providers

Mock Implementation

These consumers discover the registered capabilities and utilize the intents to execute.

Data

DogDetector

Offering registration for application/providers to advertise their capabilities and brokering of intents

Higher-level concept of dog in the cabin. Brokered intent is subscribe.

Low-level access to functions, properties, state of the Vehicle. Brokered intents are inspect, read, subscribe, invoke, discover.

Chariott

DogDetector Data

These consumers discover the registered capabilities and utilize the intents to execute.
Chariott - Dynamic App Programming Model in Action

DogMode Logic

Inspect("In-Vehicle Digital Twin")
NotifyOnNewCabilityRegistrations()

Sorry 😞, no such registered Capability
Ok!

Chariott
Chariott - Dynamic App Programming Model in Action

Chariott

DogMode Logic

Inspect("DogDetector")

Sorry 😞, no such registered Capability
Chariott - Dynamic App Programming Model in Action

- DogMode Logic
- DogMode UI

UI does the same for both In-Vehicle Digital Twin and Dog Detector
Chariott - Dynamic App Programming Model in Action

DogMode Logic

DogMode UI

NewCapability("In-Vehicle Digital Twin")

RegisterRequest("In-Vehicle Digital Twin", {"intents": ["inspect", "read", "subscribe", "invoke", "discover"]})
Chariott - Dynamic App Programming Model in Action

DogMode Logic

Discover("In-Vehicle Digital Twin")

Ok!

{"In-Vehicle Digital Twin",
{"CabinTemperature",
{"member_type": "property",
"type": "int32",
"watch": true
}
}

Ok!

subscribe ("CabinTemperature")

Discover("CabinTemperature")

{"CabinTemperature",
{"intents": ["inspect", "read", "subscribe", "invoke", "discover" ]
}

In-Vehicle Digital Twin (Project Ibeji)
Chariott - Dynamic App Programming Model in Action

Discovers “AirCon” capabilities (subscribe and invoke).
Subscribes to “on/off” state

In-Vehicle Digital Twin (Project Ibeji)

DogMode Logic

DogMode UI

Chariott
Chariott - Dynamic App Programming Model in Action

UI discovers and registers for CabinTemperature and AirCon

DogMode Logic

DogMode UI

In-Vehicle Digital Twin (Project Ibeji)
Chariott - Dynamic App Programming Model in Action

DogMode Logic

NewCapability("DogDetector")

DogDetector discovers In-Vehicle Digital Twin
DogDetector registers new DogDetector Capability

In-Vehicle Digital Twin (Project Ibeji)

DogDetector connects to camera stream

DogMode UI

DogDetector
Chariott - Dynamic App Programming Model in Action

DogMode Logic and UI get DogDetector Capabilities
DogMode Logic and UI subscribe for when a dog is detected

DogMode Logic
DogMode UI

In-Vehicle Digital Twin (Project Ibeji)
DogDetector

Chariott
Chariott - Dynamic App Programming Model in Action

- DogMode Logic
- DogMode UI
- In-Vehicle Digital Twin (Project Ibeji)
- DogDetector
- Data
- CabinTemperature, AirConState
- DogDetected
- CameraStream

Chariott
Chariott - Dynamic App Programming Model in Action

Logic desires to set AirCon to “on”

DogMode Logic

DogMode UI

Invoke AirCon(“on”)

CabinTemperature, AirConState

In-Vehicle Digital Twin (Project Ibeji)

DogDetector

DogDetected

Cabin Temperature, AirCon State

Data

Camera Stream

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Azure
Key Takeaways

- Remote API based programming model
  - gRPC proto is the contractual API
  - Common operations (inspect, read, write, invoke, discover, etc.)
- Richer brokering system modeling after COA
- Dynamic Discovery supporting direct app to app communication incl. streaming
- Inspection of the system allowing lighting up features in applications
- Readying it for integration with Ibeji (in-vehicle Digital Twin)
Community Discussion

A detailed walkthrough recording is available at Eclipse Chariott Project website.
Thank YOU.

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