THE NEXT LEVEL OF SOFTWARE DEVELOPMENT IN COMMERCIAL VEHICLES

MAN

MathWorks AUTOMOTIVE CONFERENCE EUROPE 2022

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TRATON SE

AGENDA

- 1 Commercial vehicle business & requirements
- 2 EE development current status
- 3 The next level of software development
- 4 Summary key take ways

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COMMERCIAL VEHICLE BUSINESS – MORE A MACHINE LIKE A VEHICLE



















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CURRENT STATUS – EE ARCHITECTURE (SOP 2020)



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CURRENT STATUS - FUNCTIONAL ARCHITECTURE



FUNCTIONAL DEVELOPMENT STRATEGY I



FUNCTIONAL DEVELOPMENT STRATEGY II



Sub-Networks

Many new functions only correlates existing information (signals) \rightarrow easy to implement on the middleware

TOPOLOGY



SYSTEM ARCHITECTURE



SYSTEM ARCHITECTURE



TECHNOLOGY MAP

Network

LIN CAN CAN-FD Ethernet

Connectivity

4G / 5G WLAN Bluetooth

AppFrame HTML/Jscript



Backend

AWS technology



Safety & Security

ISO 26262 up to ASIL D UNECE cyber security

Operating system

Hypervisor/Partitioning Micro C OS (AUTOSAR compatible) QNX LINUX / POSIX

Standards

MAN meta model (signal based & service oriented) AUTOSAR classic Adaptive AUTOSAR

Interfaces

SAE J1939 MAN Middleware – Mont Blanc

EESEONE DATABASE FOR ALL ENGINEERS

KEY-FUNCTIONALITY

- Content management version / variant control
- "THE relation tool"
- Requirement management
- Function data management
- Source-code management
- Architecture management
- Change/Issue management
- Agile planning component (SAFe compliant)
- Test management
- Dataset management

Digital twin

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BTC

Middleware / Application server

Oracle data base

CURRENT STATUS - EE ORGANIZATION (SAFe BASED)



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NEW CHALLENGE - DOING EVERYTHING PARALLEL







INTEGRATION OF THE VEHICLE IN THE LOGISTIC ENVIRONMENT



MOVING FUNCTIONALITY IN THE CLOUD & COMBINE WITH ADDITIONAL DATA



FUNCTION MEETS SERVICE – EFFICIENT CRUISE FOR BEV





CURRENT DEVELOPMENT - SOFTWARE DRIVEN VEHICLE

Same software technology (language, API, middleware independent of the environment (vehicle / cloud)



CLASSIC SIGNAL BASED MODEL – TASK: PROCESSING DATA



Data structure



CLASSIC SIGNAL BASED MODEL – CORRESPONDING TOOLCHAIN



SERVICE BASED MODEL – TASK: PROCESSING DATA

Model



Data structure



SERVICE BASED MODEL – CORRESPONDING TOOLCHAIN



SUMMARY

- A centralized architecture has big advantages in all dimension (cost, quality & time to market)
- 2 New end to end features for the customer leads us to a mix of vehicle & cloud oriented functions & services
- 3 This complexity leads to new development method & tools

THANK YOU VERY MUCH FOR YOUR ATTENTION.

