



AI-based intrusion detection



Software-defined vehicles (SDV)



Stellar SR6 P/G integration platform



**Stellar SR5 E/C for electrification
& safety**



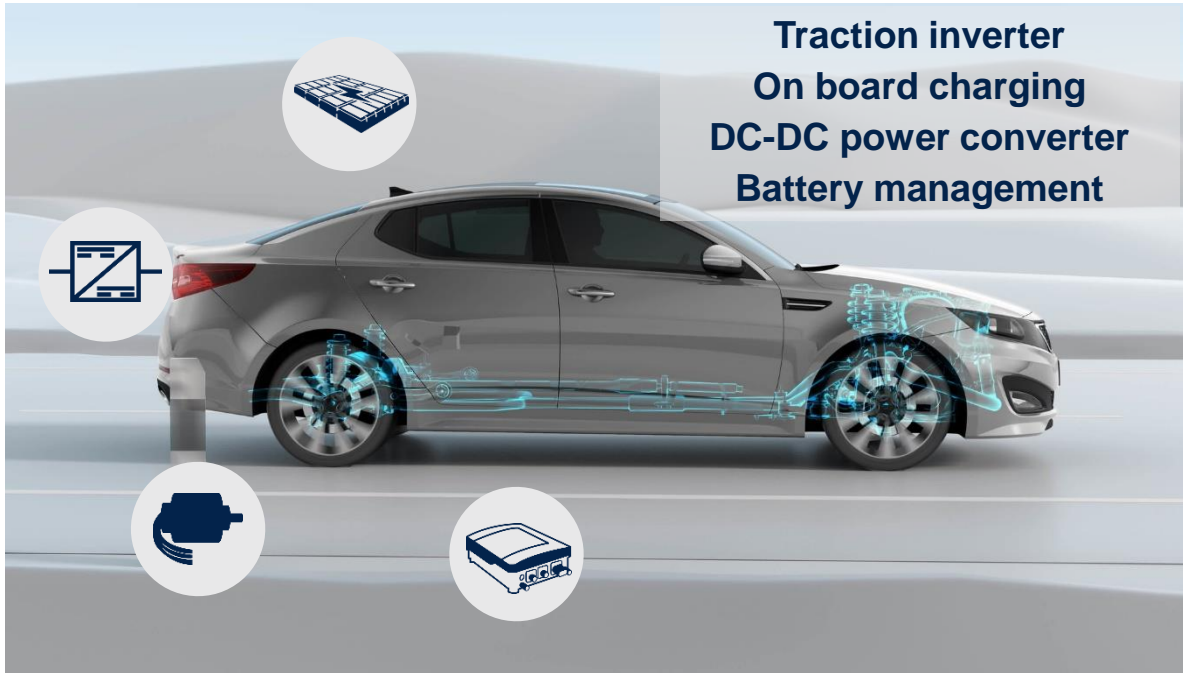
AI-based intrusion detection demo



The main trends in automotive

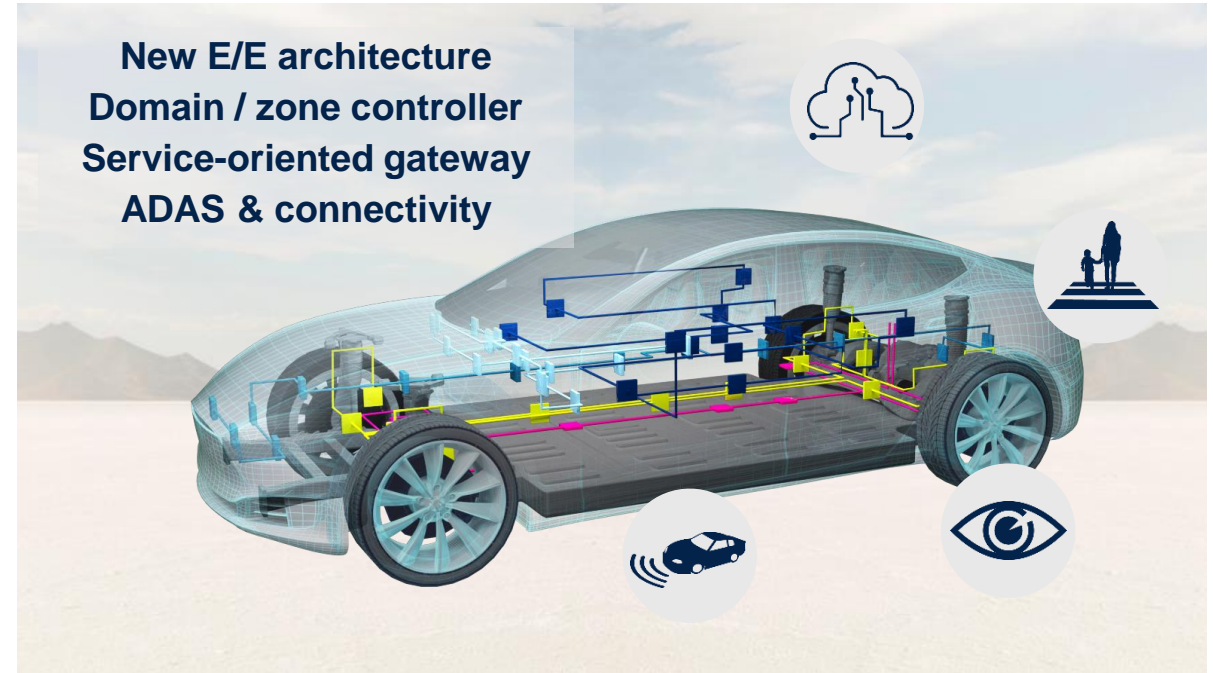
Electrification

Traction inverter
On board charging
DC-DC power converter
Battery management



Digital experience

New E/E architecture
Domain / zone controller
Service-oriented gateway
ADAS & connectivity



for a greener new driving experience

Market drivers

Growth of driver experience

ECUs Integration 

x10
Computational power

Vehicle new functions 

x6
Communication throughput
Advanced peripherals

SW complexity increase

Million lines of SW code



Year	Million lines of SW code
2022	120M
2026	400M

+150%

x3
NVM size increase
Efficient dual-image storage

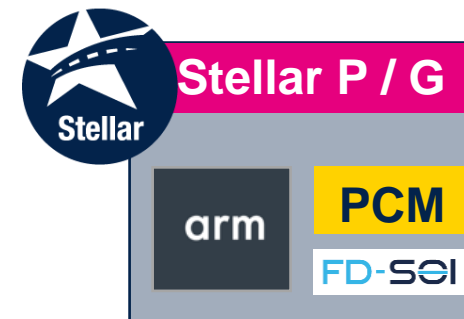
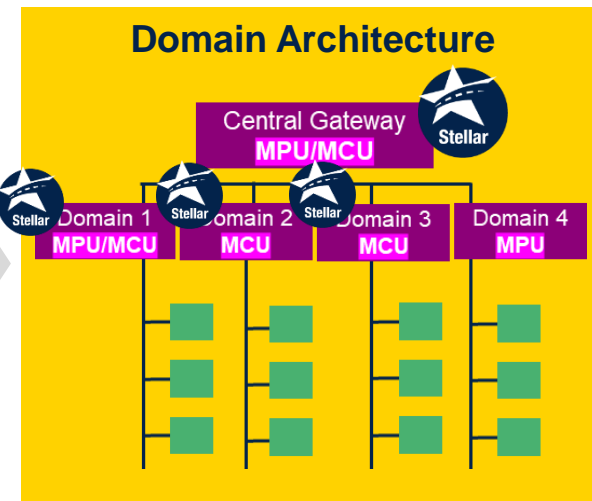
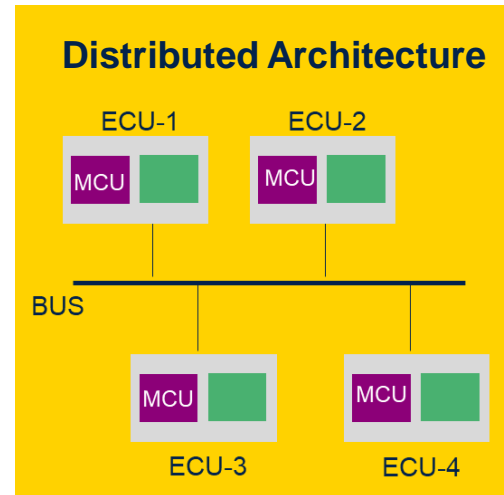
Cloud OTA 

Electrification, Power distribution 

x3
Faster Analog

x10
Switching for SiC/GAN power stages

Zone / Domain architecture increasing MCU TAM by > 1B\$

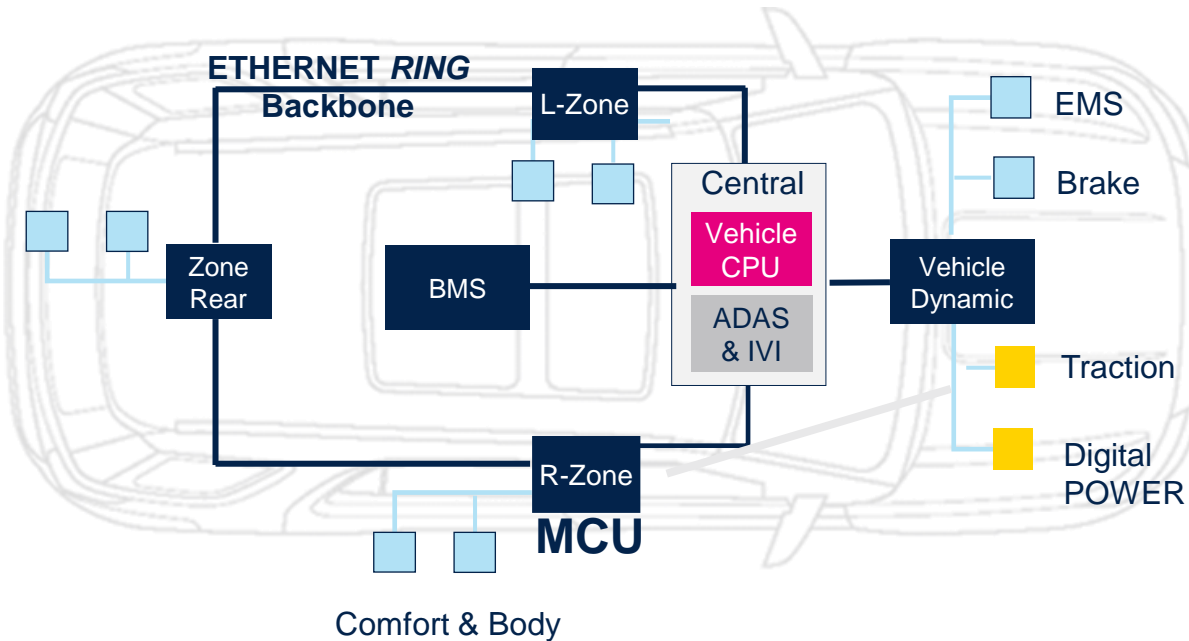




SDV: Aggregation & centralization

New Vehicle Architecture

Transformation towards lean & smart architecture

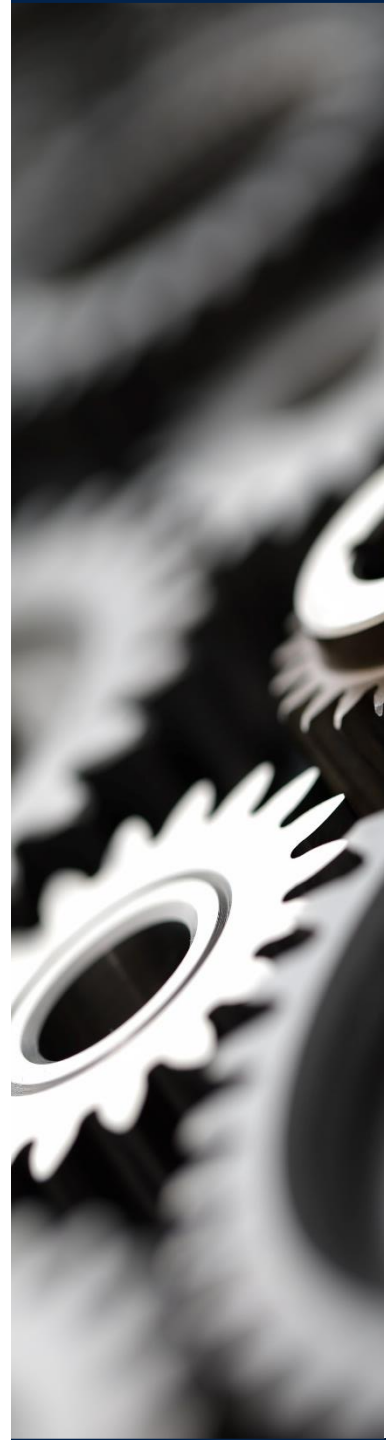


Stellar Platform

Complete real-time value chain for SDV from integration & control to Application services

SERVICE oriented	7 nm	Stellar UP SOC Service-oriented & classic integration platform	Real-time vehicle strategy	Driver monitor
			Adaptive domains	Car energy optimization
			RADAR/AVAS	Advanced AI / ML
FUNCTIONS INTEGRATION	28 nm	Stellar P / G MCUs real-time integration platform with boosted processing capability	Zone Controller	Domain controller
			Central gateway	Motion control
			Body integration	ICE/EV
ACTUATION & GP CONTROL	40 nm	Stellar E MCUs Analog performance Control integration Model-based design	Traction Inverter	OBC
			BMS	DC/DC
			Body	Safety





Stellar Scalable Platform

Arm-based
real time
computing



Service
oriented



Ethernet
centric



Virtualization



Security

Scalable in
performance



Power
efficient



Safety
up to
ASIL D

OTA





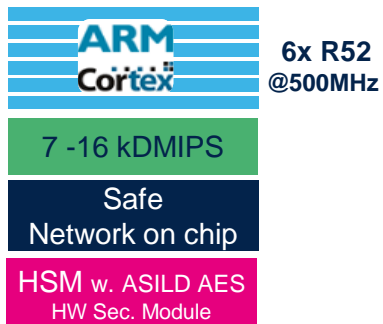
SR6 - Stellar integration MCU

Enable signal to service translation & more software integration

Future proof open architecture

Top Performances

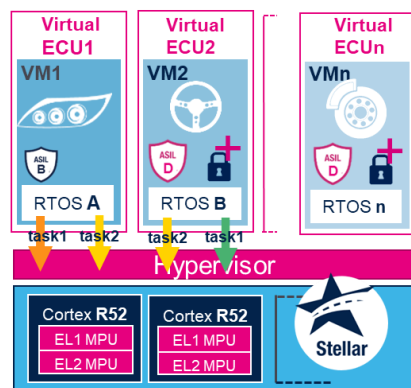
- **Real-time**
- **Safety**
- **Security**



Signal to service

Multi-ECU integration

HW virtualization to ensure safety with no interference

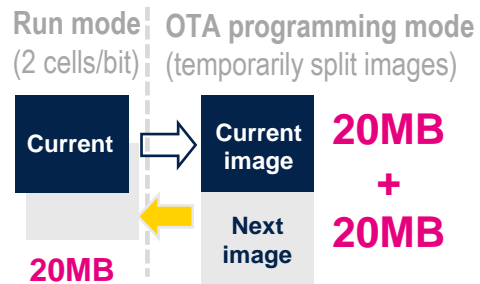


SW isolation for updates

Extensible memory & efficient OTA

Built-in memory duplication provision for OTA ("X2 mode")

No cost overhead No Downtime for running SW code



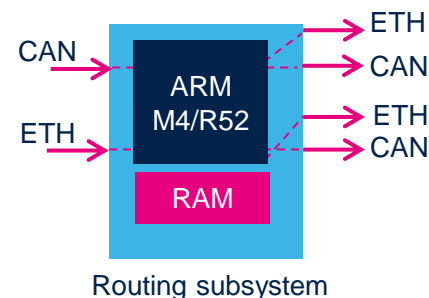
Fast Write

5.1s/MB Flash → 1.1s/MB PCM

Efficient accelerators

Ultra real-time IN/OUT Routing data processing

Off-load of main CPU



Ethernet switch

Math accelerators

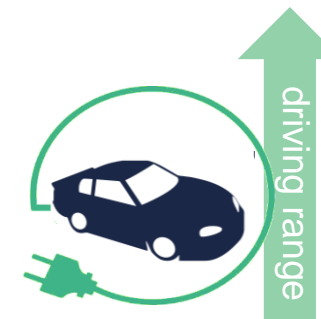
DSP co-processor

Low power

Advanced power management modes for efficient battery usage

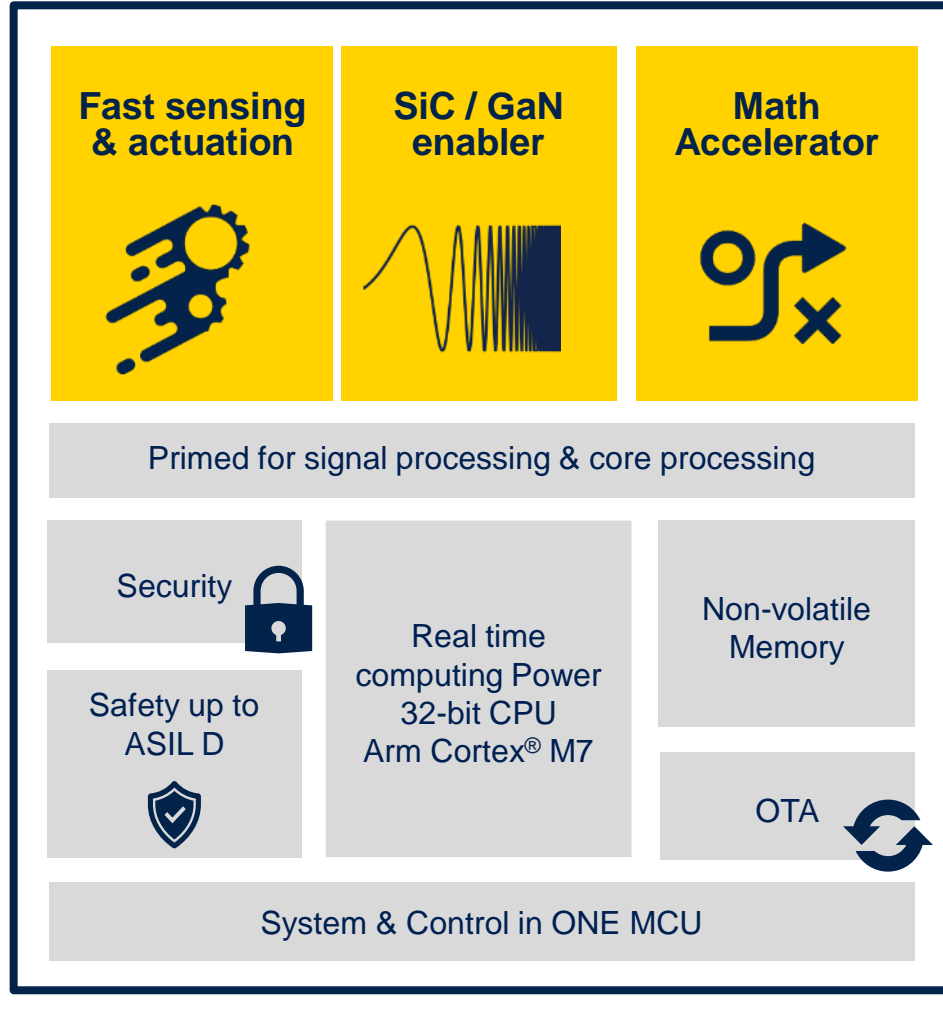
Smart Power Mode

Stand-by





Stellar Electrification MCU: Go Green





SR5 – Stellar E electrification MCU

Computing platform

Arm Cortex-M7 300MHz
Doubling performance
Safety up to ASIL-D
HSM for security

2 configurations

Cortex M7

Cortex M7

Lock-Step
Cortex M7

Max performance

Max safety ASIL-D

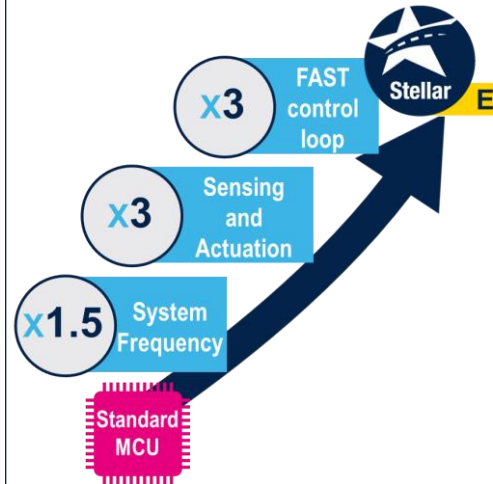
Designed for EV revolution

New energy mobility
SiC and GaN
Power efficiency



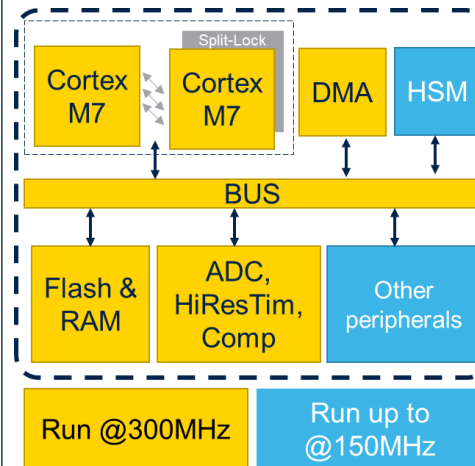
High performance analog

104ps High res timers
16-bits $\Sigma\Delta$ -ADC
2.5MSPS SAR ADC
50ns analog compare



True single frequency

Low latency response
Fast control loop
up to 1MHz



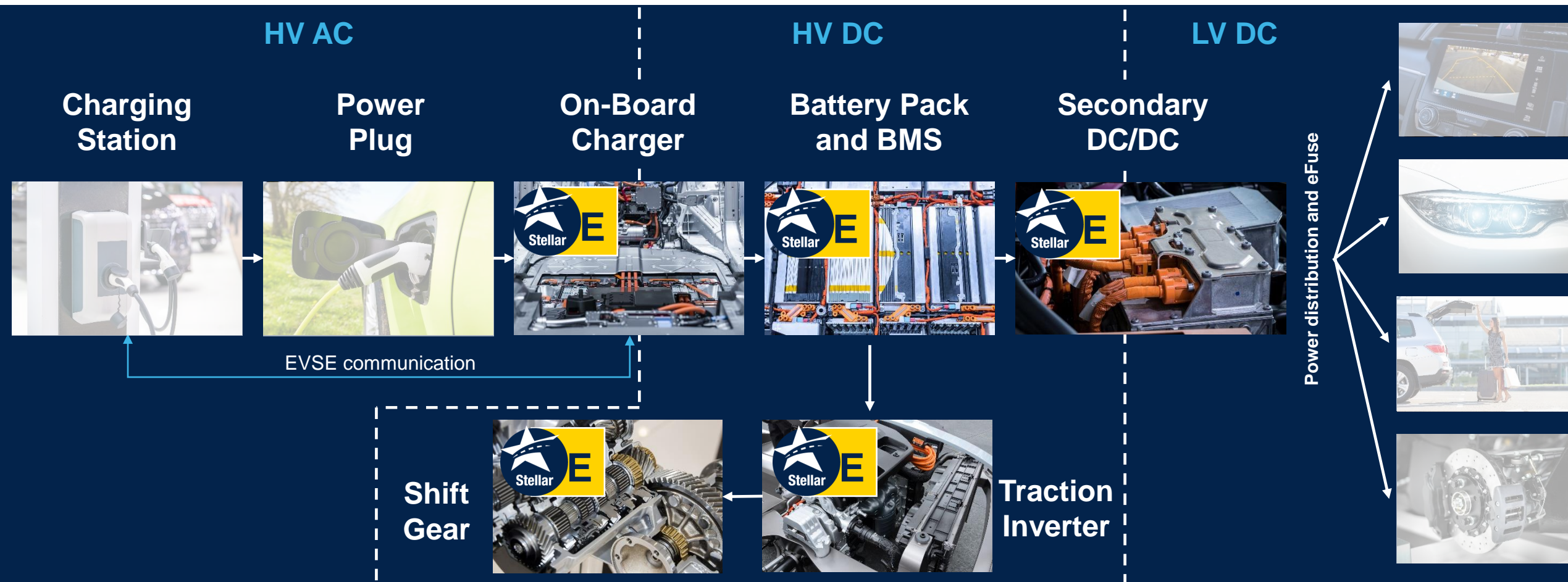
Vertical ecosystem

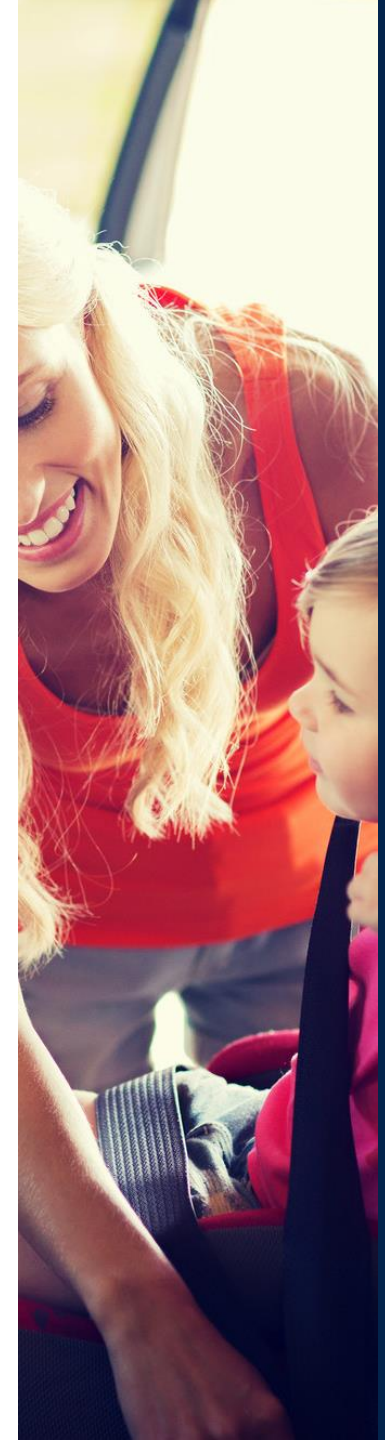
Combo OBC+DCDC
Motor control
Traction inverter





Stellar E scope in EV car power distribution





Stellar C: Next Generation MCU

Flexible Arm processing 	Security 	Safety
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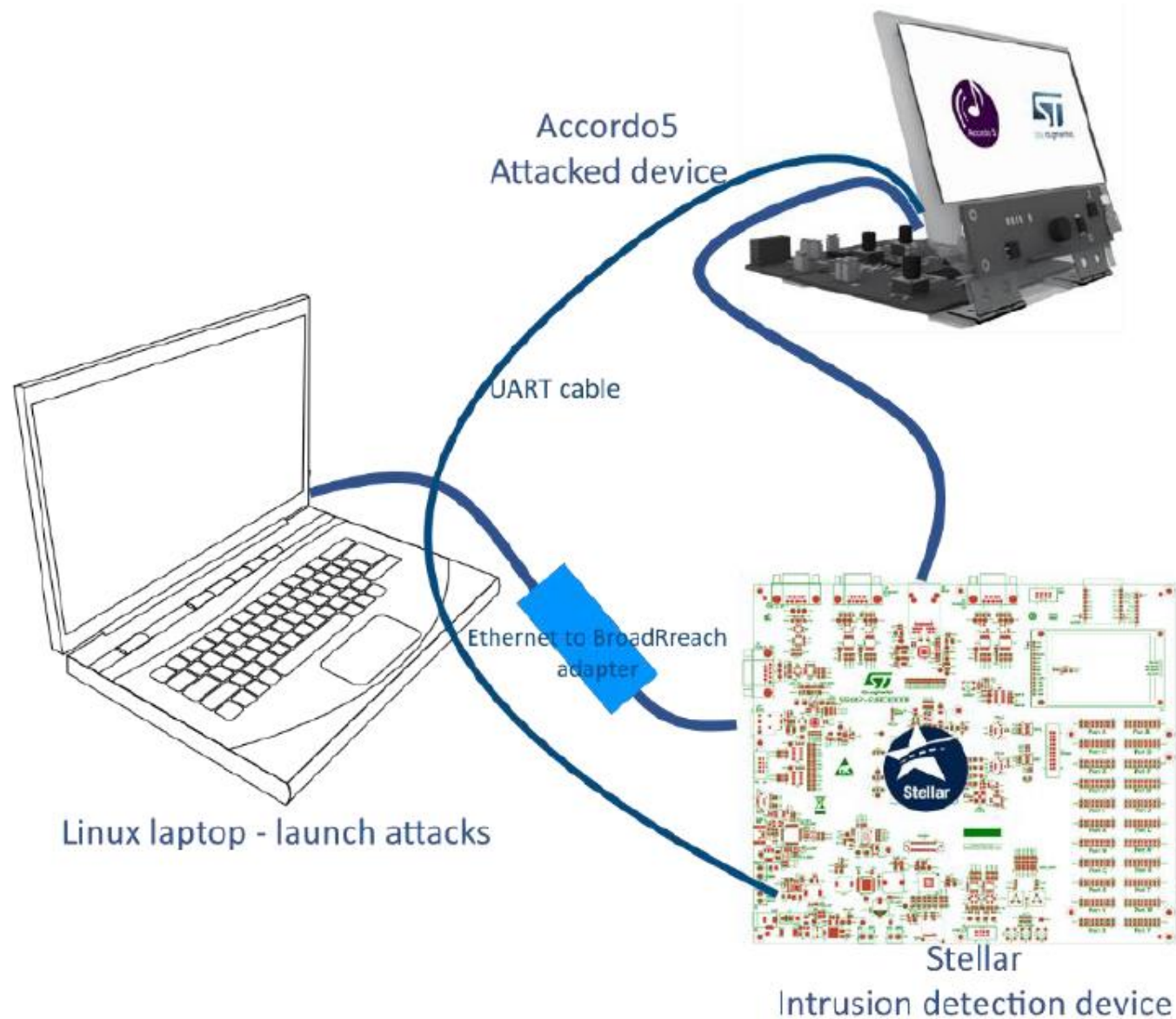
Primed for body and safety applications

Non-volatile Memory	32-bit CPU Arm Cortex® M7 With increased RAM/NVM ratio	 Scalable Package Selection
Full OTA		ETH 10B-T1S

EE Architecture Edge Nodes controller

↔ Sensors
↔ Zones / Central

AI-based intrusion detection demo diagram



AI-based intrusion detection demo key features

Advanced intrusion detection of cyber-attacks based on AI implementation enabled by Stellar 32-bit Arm® based Automotive MCUs

AI-based algorithm for enhanced detection by employing neural networks in supervised learning

Efficient implementation on Stellar Arm® MCU designed for real-time, safety critical applications

Combining AI, HW acceleration, and efficient processing to detect intrusions

