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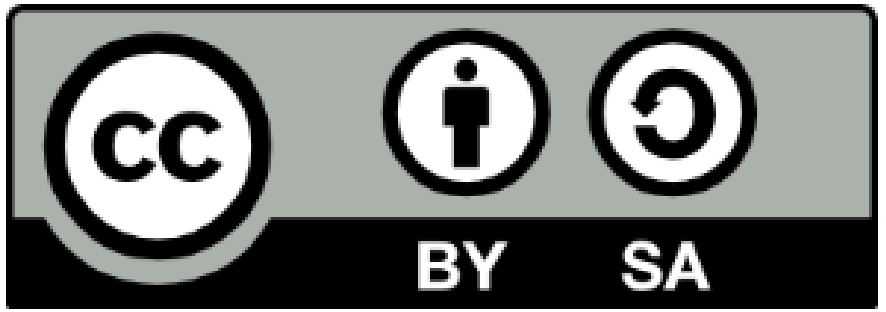

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eFMI® Tutorial – Agenda

Part 1: eFMI® motivation and overview (40 min)

Part 2: Running use-case introduction (10 min)

Part 3: Hands-on demonstration in Dymola and CATIA ESP (25 min)

Coffee break (30 min)

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Part 5: Short presentation of further tooling (5 min)

Part 6: Conclusion (5 min)

Tutorial leader:
Christoff Bürger

DASSAULT SYSTEMES

Presenter:
Oliver Lenord

BOSCH
Invented for life

Presenter:
Jörg Niere

dSPACE

efmi Functional Mock-up Interface for embedded systems

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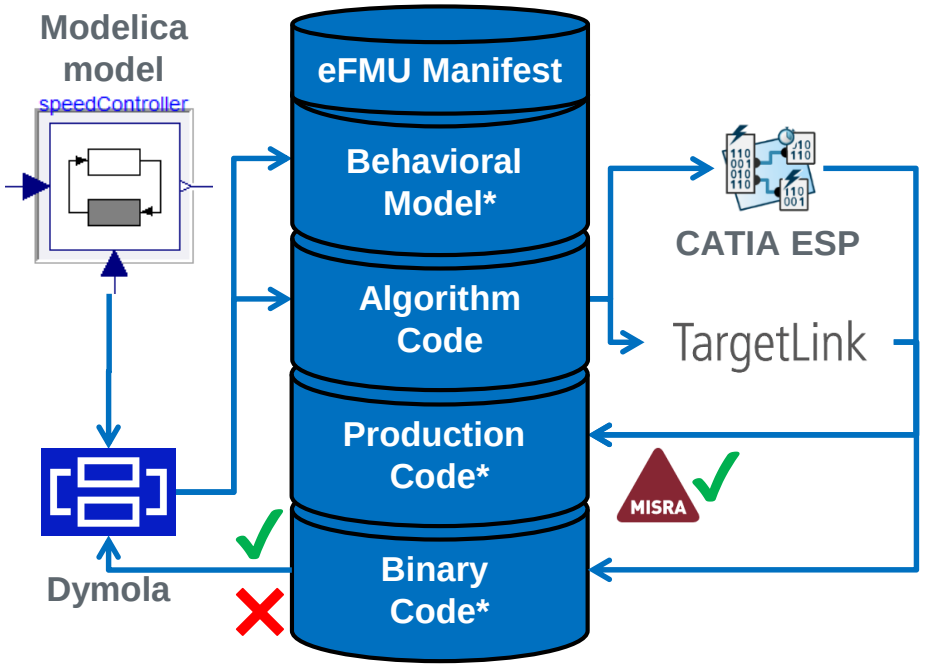

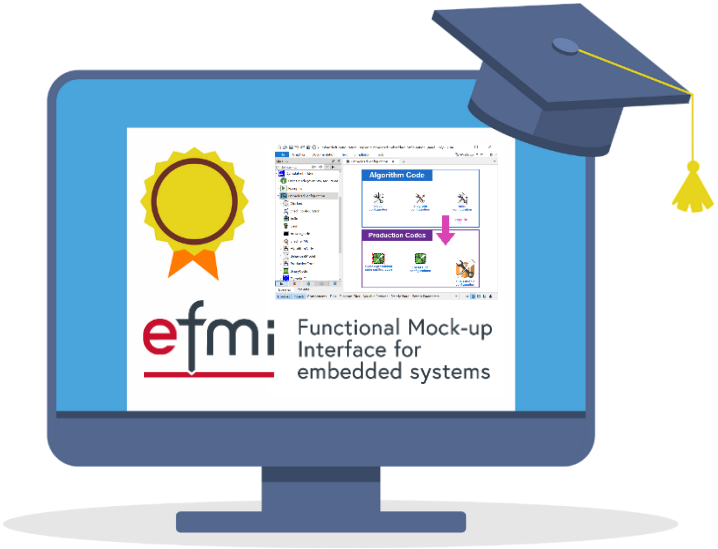

Part 5: Short presentation of further tooling

eFMI® Tutorial – 15th International Modelica Conference – 9th of October 2023

Christoff Bürger
Dassault Systèmes
Christoff.Buerger@3ds.com

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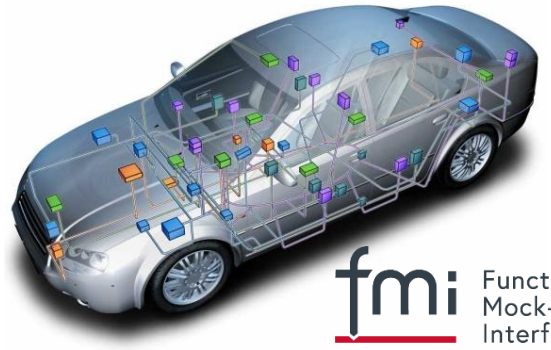
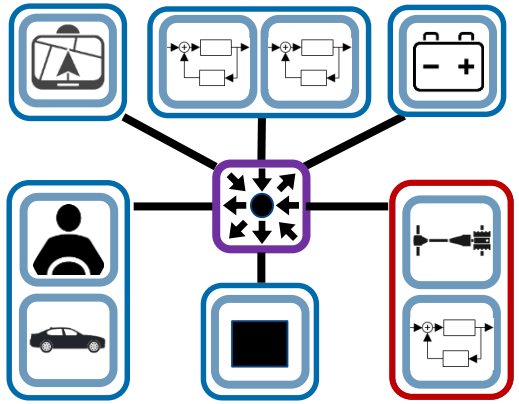
Focus of the following tooling: Embedded system integration

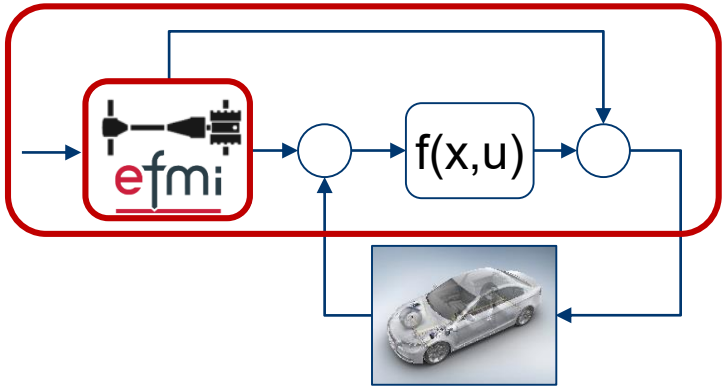
Model-based systems engineering



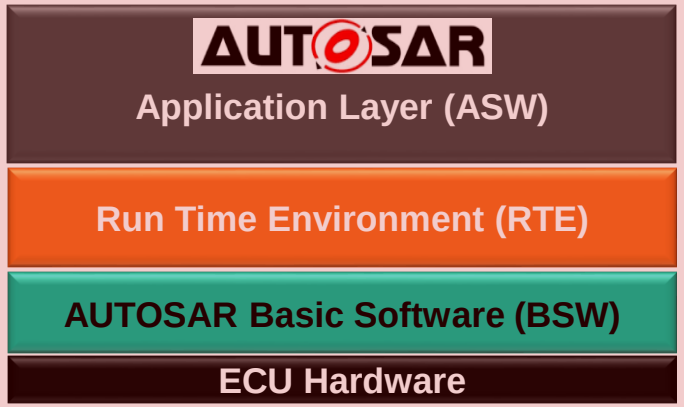


Model-based control

- Virtual sensors
- Feed-forward control
- Model-based diagnosis
- Model predictive control
- Advanced operating strategies
- …



Software engineering



SW-C

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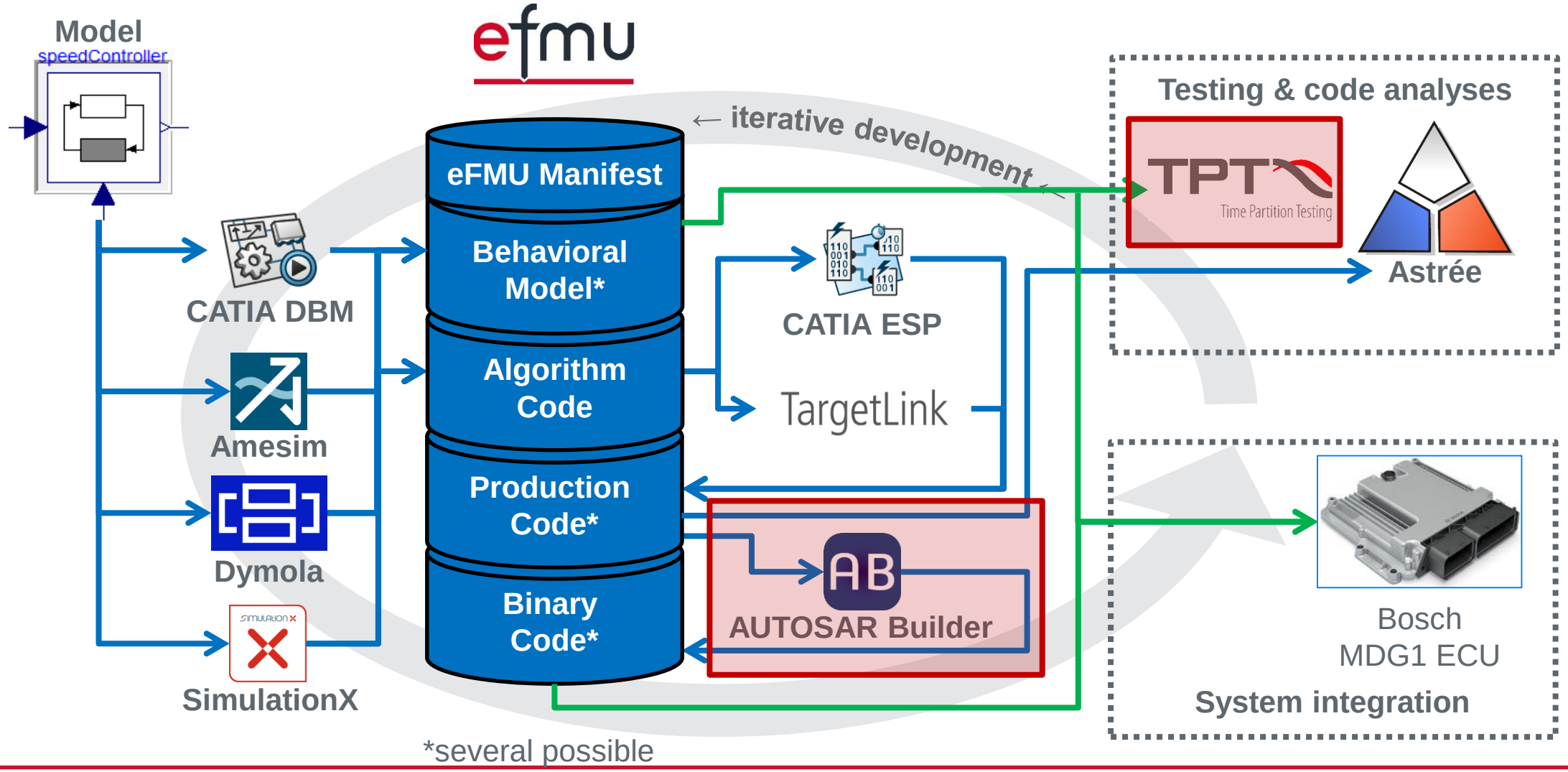
eFMI Standard: Toolchain & workflow



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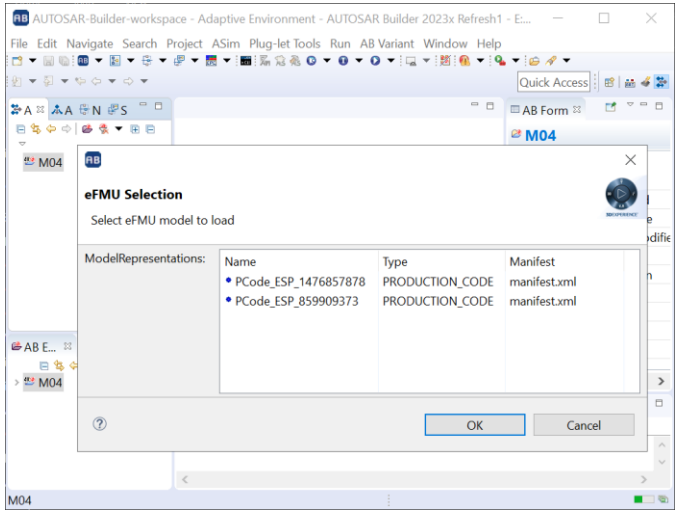
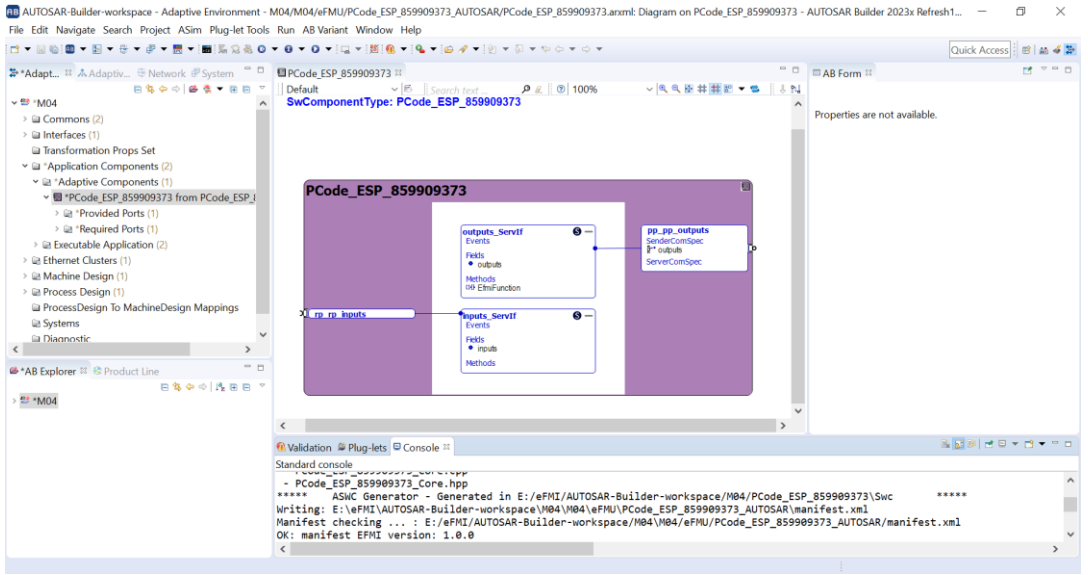
AUTOSAR Builder

- **General scope:** IDE for modeling, testing and validation of in-vehicle embedded systems for the AUTOSAR Classic and Adaptive Platforms, facilitating seamless integration with other AUTOSAR compliant tools based on the AUTOSAR Tool Platform (Artop).
- **eFMI Behavioral Model (BM):** Generate AUTOSAR test components for the test scenarios defined in BM containers.
- **eFMI Production Code (PC):** Adapt any eFMI PC container for the AUTOSAR Platform, yielding an AUTOSAR Platform compliant component ready for deployment in AUTOSAR-based target environments.
- **eFMI Binary Code:** Build binaries of AUTOSAR adapted PC containers for software-in-the-loop (SiL) tests.





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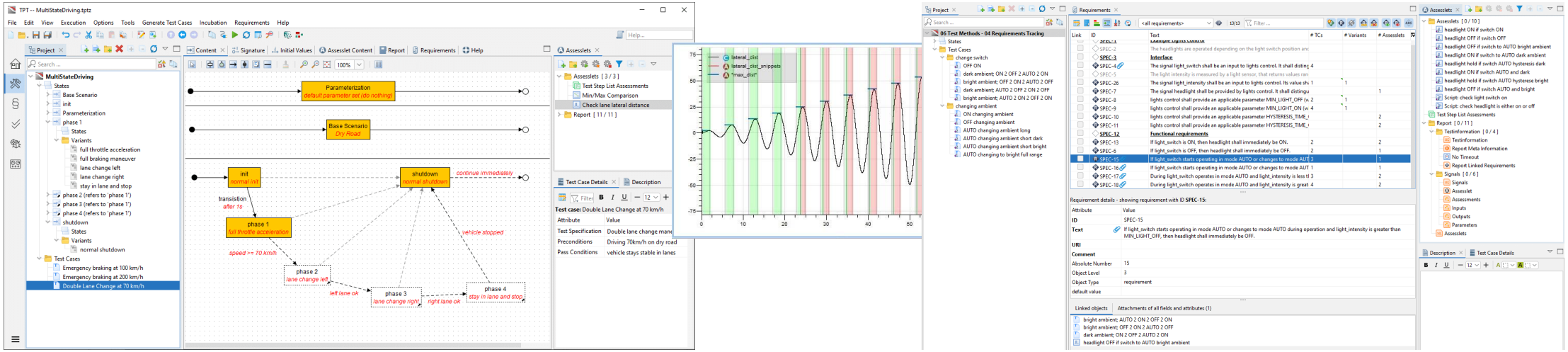
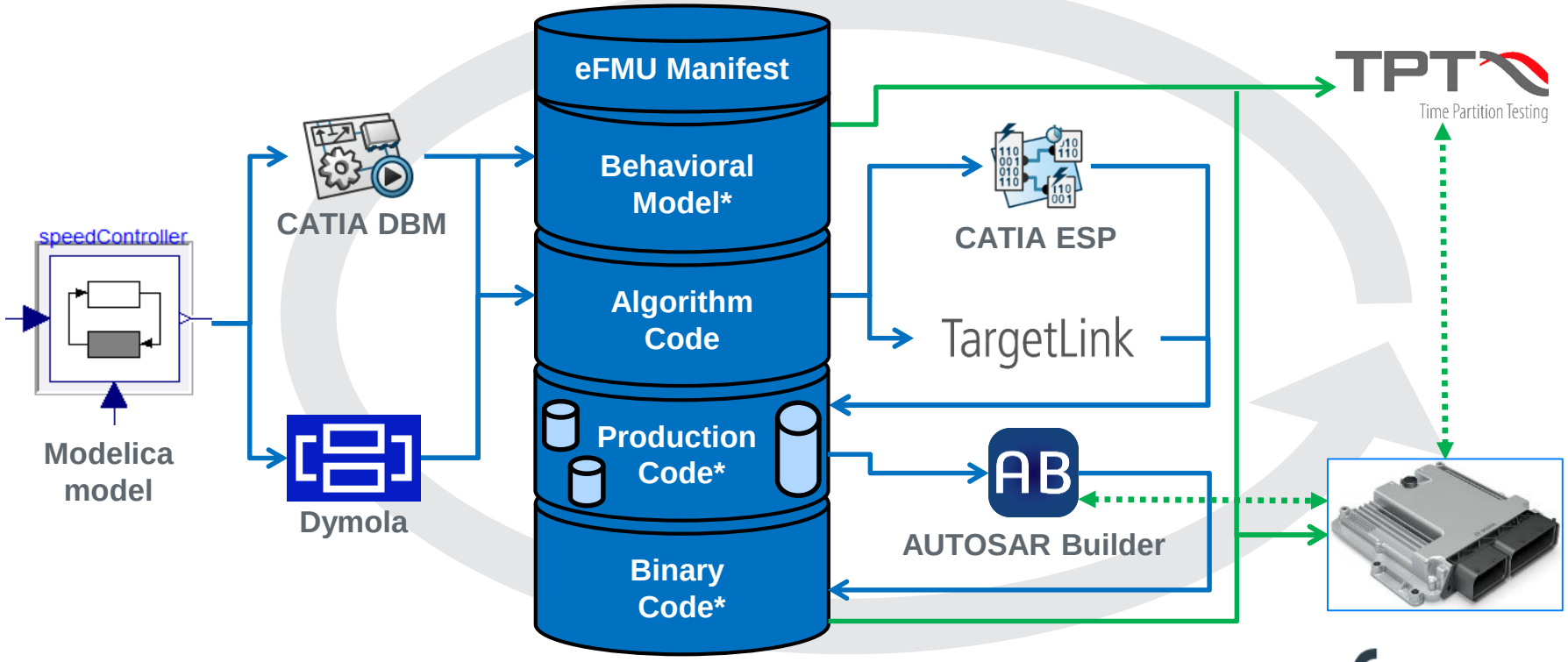
TPT

- **General scope:** IDE for testing ECU software and embedded control systems in all development phases such as model-in-the-loop (MiL), software-in-the-loop (SiL) and hardware-in-the-loop (HiL) testing, supporting relevant safety standards, such as ISO 26262, and test assessment, reporting, management and requirements traceability.
- **eFMI Behavioral Model (BM):** Testing of BM containers in many well-known, automotive (embedded) execution environments.
- **eFMI Production Code (PC):** On the fly build of the C sources of PC containers for testing.



Soon™: eFMUs in MATLAB & Simulink



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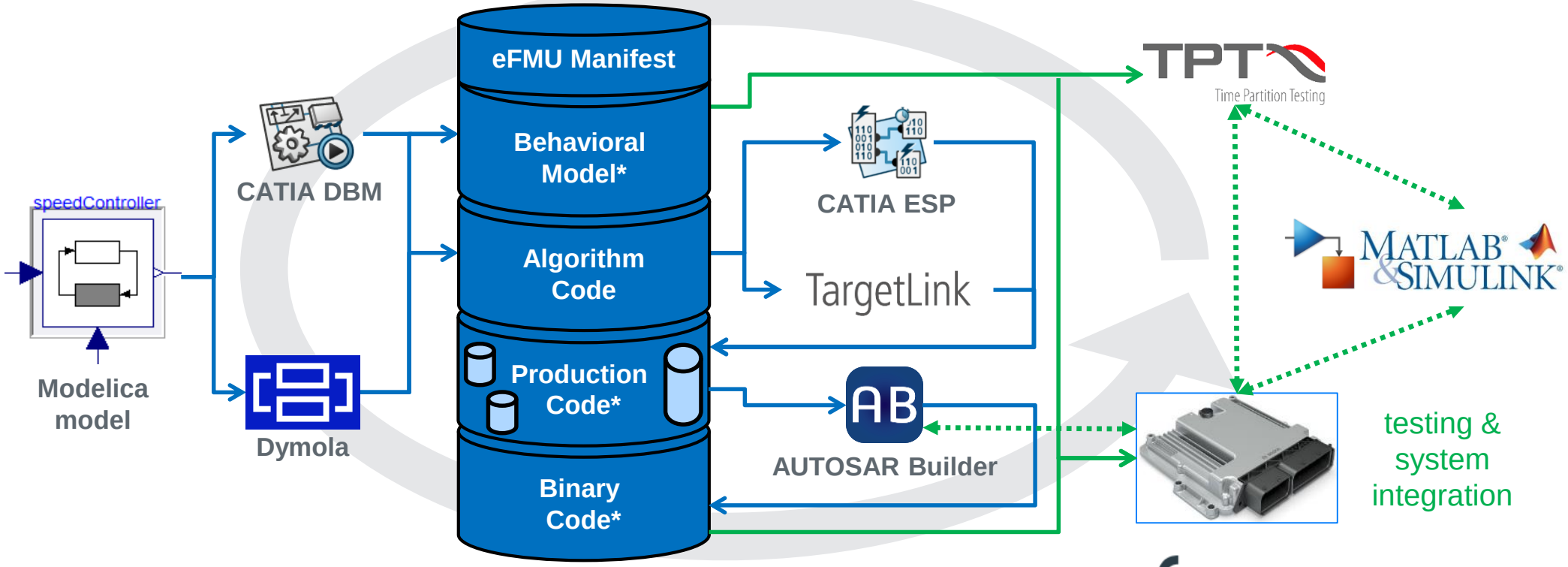

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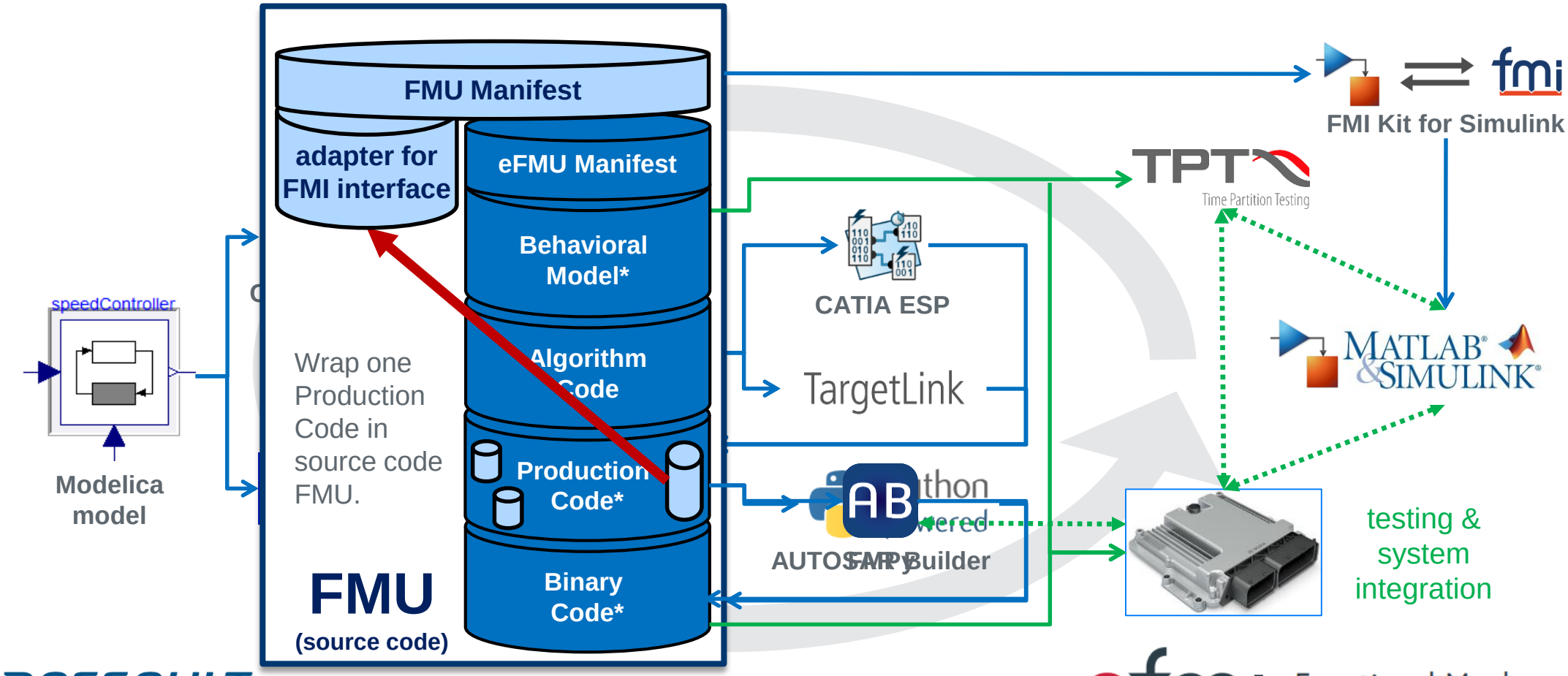
Soon™: eFMI support in FMPy & FMI Kit for Simulink



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Functional Mock-up Interface for embedded systems

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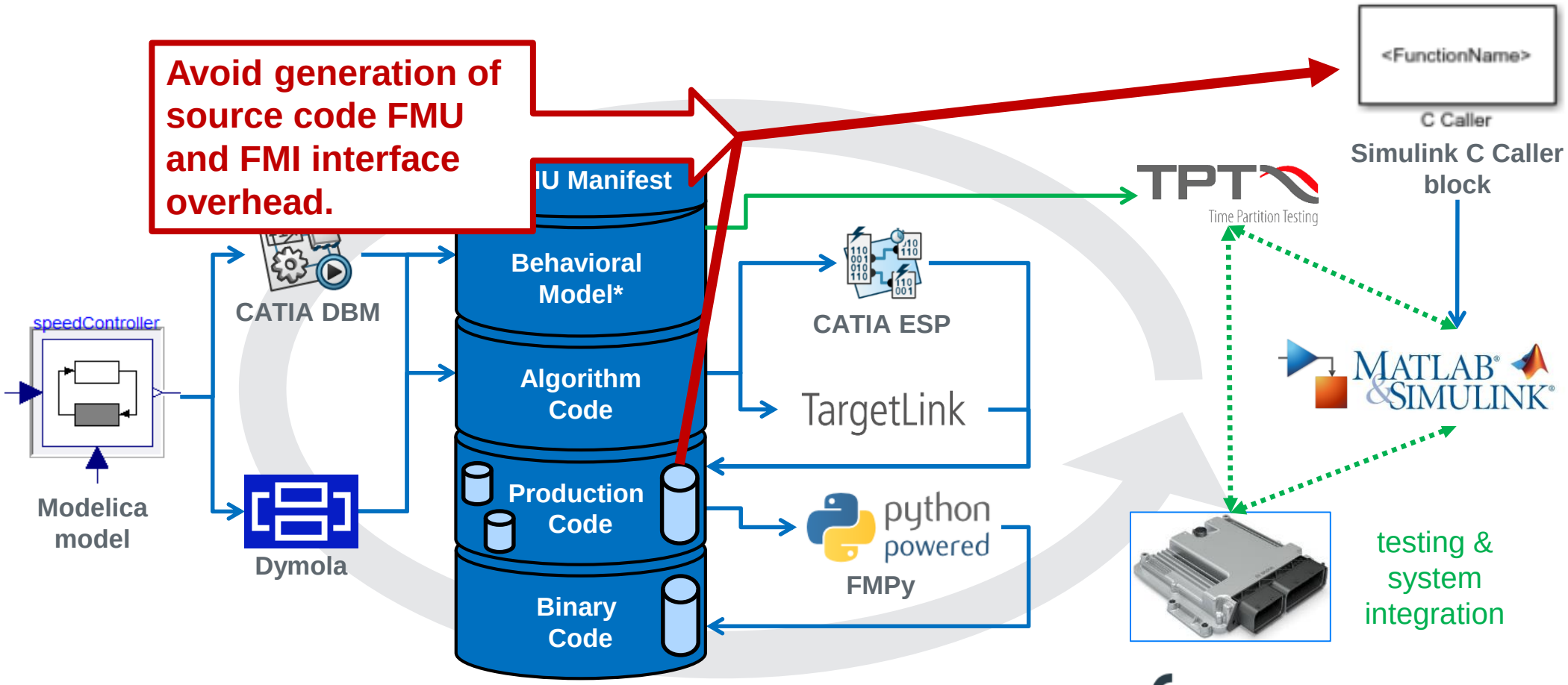
Soon™: FMPy generating Simulink C Caller block



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Questions from the audience

Which system integration scenarios outside the MATLAB – Simulink world exist for eFMI?

Which embedded target domains, platforms and ecosystems do you support?

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Questions from the audience

What are the short and long term objectives of eFMI?

What is the focal point for the success of eFMI?

What are your future research & extension perspectives?

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Questions from the audience

eFMI is a very broad subject.

Isn’t there a risk that only super experts can handle it all?

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