ITEA3 Project: ACOSAR
Advanced Co-Simulation Open System Architecture

FMI User Meeting 2017
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Rationale of the project ...

Simulation Model Interface is addressed by FMI

System modeling
Co-simulation configuration (ICOS, SystemDesk, XML, ...)

Software-in-the-loop (SiL)
Software validation

Model-in-the-loop (MiL)
System simulation

Hardware-in-the-loop (HiL)
Hardware validation

Problem:
Efficient integration of RT-Systems?
• Standardized
• Methodology
• Distributed

Requirements
(Word, DOORS, ...)

Module Level
Component Level

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Differentiation to FMI and added value:
- **Distributed Co-Simulation** by integrating tools
- **Interactive Co-Simulation** without model export
- **Integration** of (multiple) testbeds and simulations
**ACI Specification as Innovation**

**ACI integrates real-time systems and simulation environments**

ACI ... Advanced Co-Simulation Interface

ACU ... Advanced Co-Simulation Unit
ACI Architecture

**ACI control API**
Convencience API, reference implementation will be available, not subject to standardization

**ACI communication API**
exchange of rx/tx ACI messages

Proprietary or custom API

Media (e.g. bus) runs a communication protocol

**Model, Function, Application, ...**

**ACI protocol**
(logic)

**ACI Driver**

**Media Driver**

**Model or Function**
Subject to integration with other models or RT systems

**ACI protocol or ACI logic**: Defines the sequence and contents of ACI messages to be exchanged between ACUs in order to carry out specified ACI functions. *May be monolithic within model or RT system.*

**ACI driver**: Standardize mapping from ACI protocol to transport protocol. Contains no execution logic.

**Media driver**: Proprietary or self-written libraries, executables, scripts, etc., directly controls the communication media

**Key**
* Subject to standardization
~ Specification but no standardization
... a follow-up initiative called ACOSAR

**ITEA3 Project ACOSAR**
- Advanced Co-simulation Open System ARchitecture
- Setting a global standard for integration of RT systems

**Motivation**
- Fast integration of RT Systems
- Tool neutral standard for distributed co-simulation

**9 Automotive Use-Cases**
- Test system integration
- Distributed development
Community ...

You are welcome to join the ACOSAR initiative!

www.acosar.eu

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Open Questions?

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