nlr

Dedicated to innovation in aerospace

MOSAIC: Automated transfer of simulation models

PRODUCTS & SERVICES

NLR provides MOSAIC, the transfer tool between modelling and simulation tools and simulation standards.

Aerospace engineers often use specific tools (e.g. Simulink) to create simulation models and control algorithms. To test these models and algorithms with hardware in the loop they must be simulated in a real-time simulation environment. Furthermore, for portability and reuse, simulation models must often comply with a simulation standard, e.g. ECSS SMP (Simulation Model Portability). In order to reduce development cost and time it is widely acknowledged that automatic model transfer from modelling tools to real-time simulation environments and simulation standards is essential.

Sattelite development: Sloshat, Automated Transfer Vehicle (ATV)

WHAT YOU NEED

End-to-end support for conversion of Simulink models into code that is compliant with the Simulation Model Portability (SMP) standard and ready to use within real-time simulation environments.

WHAT WE DELIVER

MOSAIC 12: a one-step tool that generates SMP compliant code from Simulink models and specific platform files for real-time simulation environments such as EuroSim or SIMSAT. MOSAIC 12 is tightly integrated with Simulink.

OUR CAPABILITIES

MOSAIC 12 generates SMP compliant code from Simulink. Besides it also generates SMP compliant code from other modelling tools: EcosimPro and 20-sim. The SMP2 Conformance Suite (CS) has been used to validate SMP compliancy of MOSAIC 12 generated code. In addition Native EuroSim model code can be generated from Simulink with MOSAIC 12.
In particular, the following transfer use cases have been validated:

- Simulink to EuroSim SMP2 Mk6.2 Native
- Simulink to EuroSim SMP2 Mk6.2 SMP
- Simulink to SimVis 3.1/SIMSAT 4.3
- EcosimPro 4.8 to SimVis 3.1/ SIMSAT4.3
- 20-sim 4.1 to SimVis 3.1/ SIMSAT 4.3

MOSAIC 12 was developed in collaboration with MathWorks under a contract awarded by ESA/ESTEC No 4000119925.

OUR CAPABILITIES

MOSAIC 12 runs as plug-in with Simulink (on Windows).
SMP compliant model code or native EuroSim C++ code can be generated from a Simulink model in one-step: by running the Simulink Coder or Embedder Coder which invoke MOSAIC by means of a specific System Target File.
MOSAIC intends to be independent from MATLAB versions.
MOSAIC 12.0 was tested with MATLAB R2015a, R2016a R2016b and R2017a.

PRODUCTS & FEATURES

- MOSAIC 12 is commercially available from NLR (free in ESA member states). User requests can be sent to mosaic@nlr.nl.
- MOSAIC is now also available as MATLAB 3rd party add-on product through the MathWorks Connections Program.