

Automatic Timing Simulation and Execution Time Measurement with AUTOSAR

Case Study



The Challenge

The timing analysis and scheduling simulation of AUTOSAR ECU software is often associated with high modeling effort.

In real-time multi-core systems, individual task executions are blocked in some cases due to cross-core dependencies. This affects the system performance. A model-based simulation helps to capture these negative multi-core effects and is therefore a basis for an effective improvement of system performance. A timing model is used to abstract the complexity of the system. This requires static information such as task configuration and operating system properties. In addition, the timing model requires dynamic information such as the execution times of the individual runnables. Creating a timing model with the right level of abstraction involves development effort.

The Solution

The TA Workflow is an automation environment within the TA Tool Suite with interfaces to DaVinci Configurator Pro and the winIDEA Profiler from iSYSTEM.

The TA Workflow allows the automatization of manual steps in the TA Tool Suite and its interfaces to other development tools. Standardized command blocks enable an automation process within a TA Tool Suite project to be described.

The TA Workflow presented here takes the already available data via interfaces to software tools and creates a simulable timing model. This model continuously follows the current state of development. For the import of static model information, it is sufficient to select the corresponding MICROSAR project. The TA Workflow and DaVinci Configurator Pro from Vector ensure automatic processing of the parameters. The iSYSTEM Profiler simplifies the recording of the execution time measurements from an ECU. Debugging and tracing takes place in interaction with the MICROSAR.OS operating system.

In this way, the TA Workflow directly reads all current execution times of the runnables via the automation interfaces provided by iSYSTEM from the ECU with the corresponding DaVinci Configurator Pro configuration.

The Advantages

Easy model creation for scheduling simulation with real execution times.

- > Time saving through automated creation of a timing model
- > Model information tracks the development process and thereby reflects current system behavior
- > Automatic runtime analysis and verification of the timing behavior with the optionally available tools TA.Inspection and iSYSTEM Debugger

Necessary Tools

Use the TA Workflow with MICROSAR, DaVinci Configurator Pro, TA Tool Suite with the options TA.Simulation and TA.Inspection as well as the iSYSTEM Debugger.

More information:

- www.vector.com/ta-tool-suite
- www.iSYSTEM.com/vector

