SYNOPSYS®

DATASHEET

Silver

Virtualization of ECUs

Virtual ECUs bring code to life

Overview

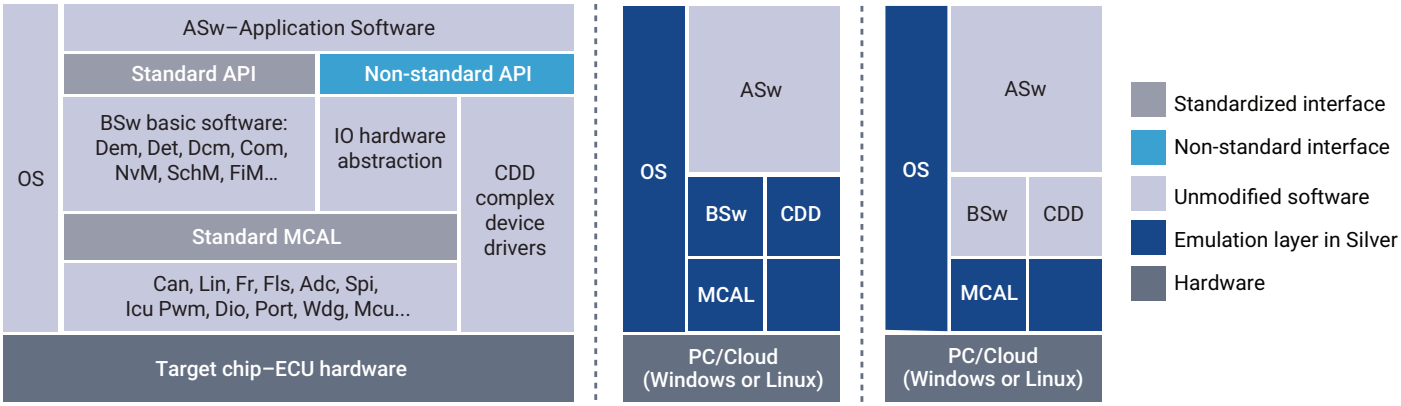
Silver, a virtual ECU platform, is used to move development tasks from road and test rigs to your computer, enabling the most efficient development.

Virtual ECUs

Silver is a tool for creating and running virtual ECUs. It moves development tasks from road and test rig to your computer.

How Much of the ECU Software Runs Inside a vECU?

Depending on the use case and the availability of source code, different parts of the ECU software can be ported to a computer. The figures below show two typical virtualizations of an AUTOSAR ECU: (A) only the Application Software (ASw) is virtualised, (B) also parts of the Basic Software (BSw).



Building vECUs with Silver

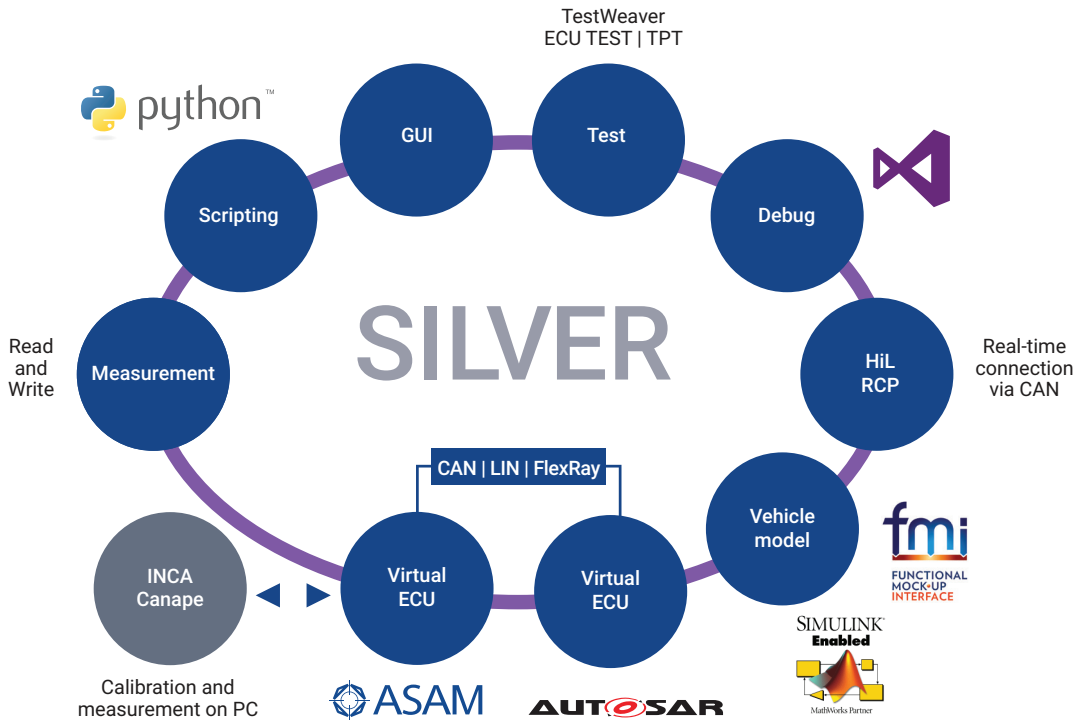
Established coverage measures used by TestWeaver for software controllers are: statement, decision and MC/DC code coverage. Silver supports two ways to build vECUs:

- Based on ECU source code—by compiling the C code for your computer
- Based on ECU binary code (Hex file)—with Silver's chip simulation feature, supported for MCUs of the Tricore (Infineon) and PowerPC (NXP/ Freescale and STM) families

The build procedure is similar in both cases:

- Write a configuration file that describes the desired vECU, for instance, tasks to run, inputs and outputs
- Let Silver build the vECU from the configuration file. The resulting vECU can be simulated with Silver, Simulink or with any FMU simulator

Silver as Execution Platform for vECUs



One Tool—Many Use Cases

Besides a mature build process, Silver also provides a powerful execution and experimentation platform for virtual ECUs. Silver executes one or more networked vECUs on a computer, in closed-loop with simulation models for engine, transmission and vehicle. Silver also offers a real-time mode for connecting to real hard-ware via CAN. Many other use cases are also supported: test automation, source level debugging, code coverage measurement, parameter studies, pre-calibration.

Since the first release in 2008, Silver has acquired hundreds of users worldwide. Leading OEMs and suppliers use Silver for developing, testing and tuning control software. More about applications: https://www.synopsys.com/verification/virtual-prototyping/virtual-ecu/references.html

What Is the Effort to Build a vECU?

We distinguish between the initial effort to set up an automated build process and the incremental effort for the repeated generation of vECUs during the product development. The initial setup effort can require days to weeks. The update of the vECU for a new software version can thereafter most often be done automatically within minutes or hours, for instance as part of “nightly builds”.

Support for Automotive Standards

Silver supports many automotive standards and can therefore easily be coupled with other tools, such as INCA, CANape, MATLAB/Simulink, CarMaker, GT-Power, axisuite, Dymola, SimulationX, AMESim and Simpack.

Information on New Features

This data sheet provides a summary of supported features and may not reflect all the features added in recent releases. Please contact your local Synopsys sales office for complete information about new features and enhancements.