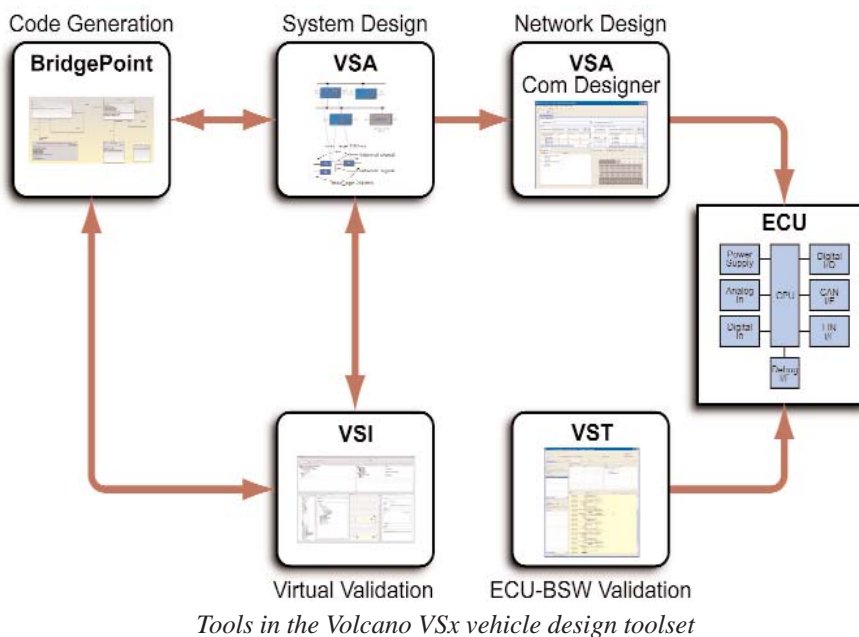


# Volcano™ VSA Vehicle Systems Architect

Vehicle Systems Design

D A T A S H E E T



## VSA Product Features

- SW architecture design - define SW components and compositions
- HW architecture design - define ECUs, networks, sensors and actuators
- Integration with industry-standard configuration management systems
- Scripting language support provides implementation of consistency checks or custom operations
- Consistency checks help ensure consistency of design data, both at the component and system level
- True AUTOSAR compliance - VSA supports the full AUTOSAR meta-model and its formats
- Captures system-level timing requirements by incorporating TIMMO elements within the AUTOSAR objects of the design
- User-configurable organization of design data maximizes reuse of existing objects
- Powerful merge feature allows combined design data to be edited in various locations
- Generates AUTOSAR ECU extract and other AUTOSAR standard files
- Supports the ODX diagnostics exchange format
- Open, flexible, Eclipse-based platform enables creation of design environment tailored to individual needs

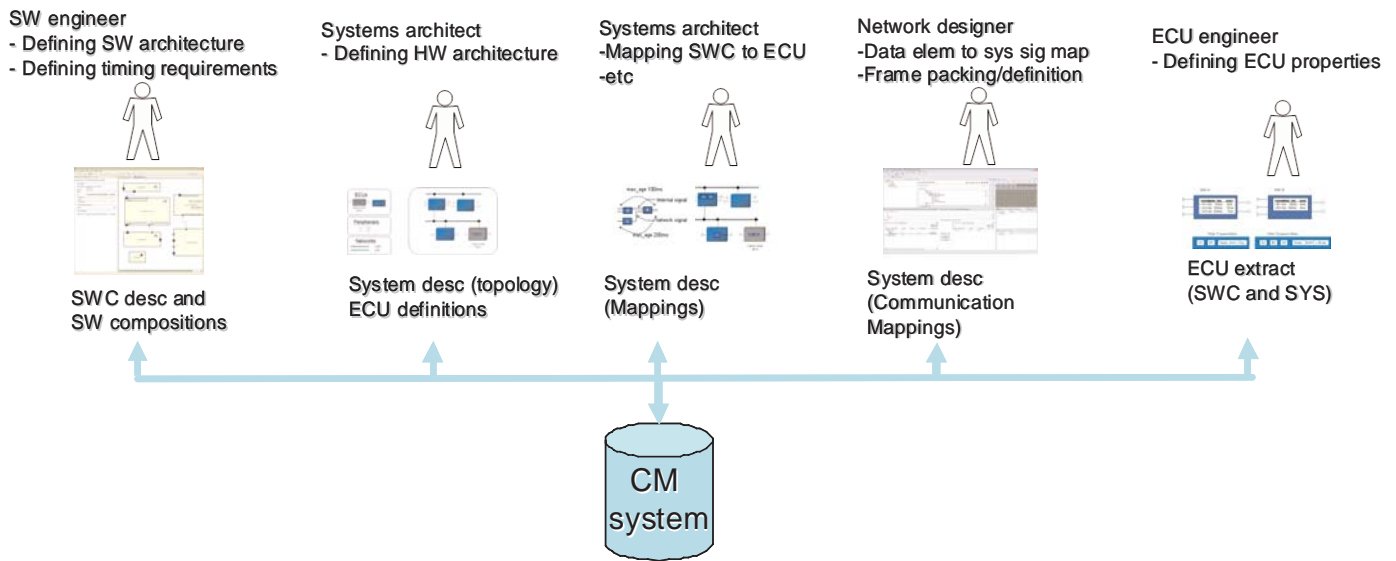
## Volcano VSA: Enabling AUTOSAR System Design for Development Teams

Volcano VSA is part of the comprehensive Mentor Graphics Volcano vehicle systems design toolset, which provides a robust medium for an AUTOSAR-based vehicle system design flow including E/E architectural design, application software development, virtual validation, and software test. VSA is a system design tool for AUTOSAR-based systems. It enables engineers to design automotive SW and HW architectures and to manage the relationships between the two. At the same time, it provides the user with required support to manage industrial-scale projects with distributed development partners.

### A "Correct-by-Design" Development Methodology

VSA enables the design of the SW and HW architecture of an AUTOSAR system, the mapping of SW components (SWCs) to electronic control units (ECUs) and the system signals exchanged between them. VSA supports the full AUTOSAR data model and enables industrial-scale development projects with multiple users and iterative development through the use of integrated configuration management and merge technologies.

By leveraging the EAST ADL2 language and the results of the TIMMO research project, VSA enables users to capture requirements on a higher level of abstraction than AUTOSAR supports. This provides the foundation for a contract-based development process where correctness can be guaranteed at design time.



VSA user roles and tasks in an AUTOSAR-based development process

### Development Process Steps

- SW architecture - Defining the SW architecture is largely about defining SWCs in terms of their ports, interfaces and connections between the SWCs. This can be done by SW designers, architects or functional engineers.
- HW architecture (topology/ECUs) - System architects define the structure of the system in terms of communication networks and ECUs. In AUTOSAR terms, this is about defining the "core topology" of the system.
- SWC deployment - SWCs need to be assigned to ECUs. This can be done by system architects, ECU designers or other engineers.
- Network design - Data element to system signal mapping, signal to IPDU mapping, frame definition. This is a feature of VSA Com Designer for CAN, LIN or FlexRay only.
- ECU definition (ECU resource) - Before the design data can be used for configuring the ECU SW in detail, the so-called ECU resource definition needs to be completed. This includes sensor and actuator connections and other aspects of ECU HW/SW.

### VSA Optional Products for Network Design

- FlexRay Communication Designer
- CAN Communication Designer
- LIN Communication Designer

These products enable the user to design and analyze communication matrices for the respective protocol. The communication designer tools use the AUTOSAR timing model. They provide comprehensive features to ensure consistency of the design and fulfilment of the specified timing requirements.

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