The Volcano Vehicle System Architect is part of the comprehensive Mentor Graphics 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.

Enabling AUTOSAR System Design for Development Teams

The Volcano Vehicle Systems Architect (VSA) is a system design tool for AUTOSAR-based systems. It enables engineers to design automotive software and hardware 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 software and hardware architecture of an AUTOSAR system, the mapping of the software components to electronic control units (ECUs), and the system signals exchanged between them. VSA supports the full AUTOSAR data model. It 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-ADL language and the results of the TIMMO research project, VSA enables users to capture requirements on a higher level of abstraction than even AUTOSAR supports. This provides the foundation for a contract-based development process where correctness can be guaranteed at design time.

FEATURES AND BENEFITS:

- Software architecture design defines software components and compositions
- Hardware architecture design defines ECUs, networks, sensors, and actuators
- 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 levels
- Supports the full AUTOSAR meta model and its formats to provide true AUTOSAR compliance
- 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 features allow 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
- Integration with industry-standard configuration management systems
Development Process Steps

Software Architecture: Defining the software architecture is largely about defining software components in terms of their ports, interfaces, and connections between the software components. This can be done by software designers, architects, or functional engineers.

Hardware 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 technology” of the system.

Software Components Deployment: Software components must 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 an optional feature of VSA: VSA COM Designer for CAN, LIN, or FlexRay.

ECU Definition (ECU resource): Before the design data can be used for configuring the ECU software in detail, the so-called ECU resource definition needs to be completed. This includes sensor and actuator connections and other aspects of ECU hardware/software.

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 fulfillment of the specified timing requirements.

Volcano VSx Tool Suite

Volcano VSA is part of the comprehensive Mentor Graphics Volcano AUTOSAR VSx tool chain. All VSx tools are built upon the Eclipse framework and thus are part of a modular and open framework for development tools.

For the latest product information, call us or visit: www.mentor.com/vnd

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