MAENAD

Model-based Analysis & Engineering of Novel Architectures for Dependable Electric Vehicles

EAST-ADL Model Organization

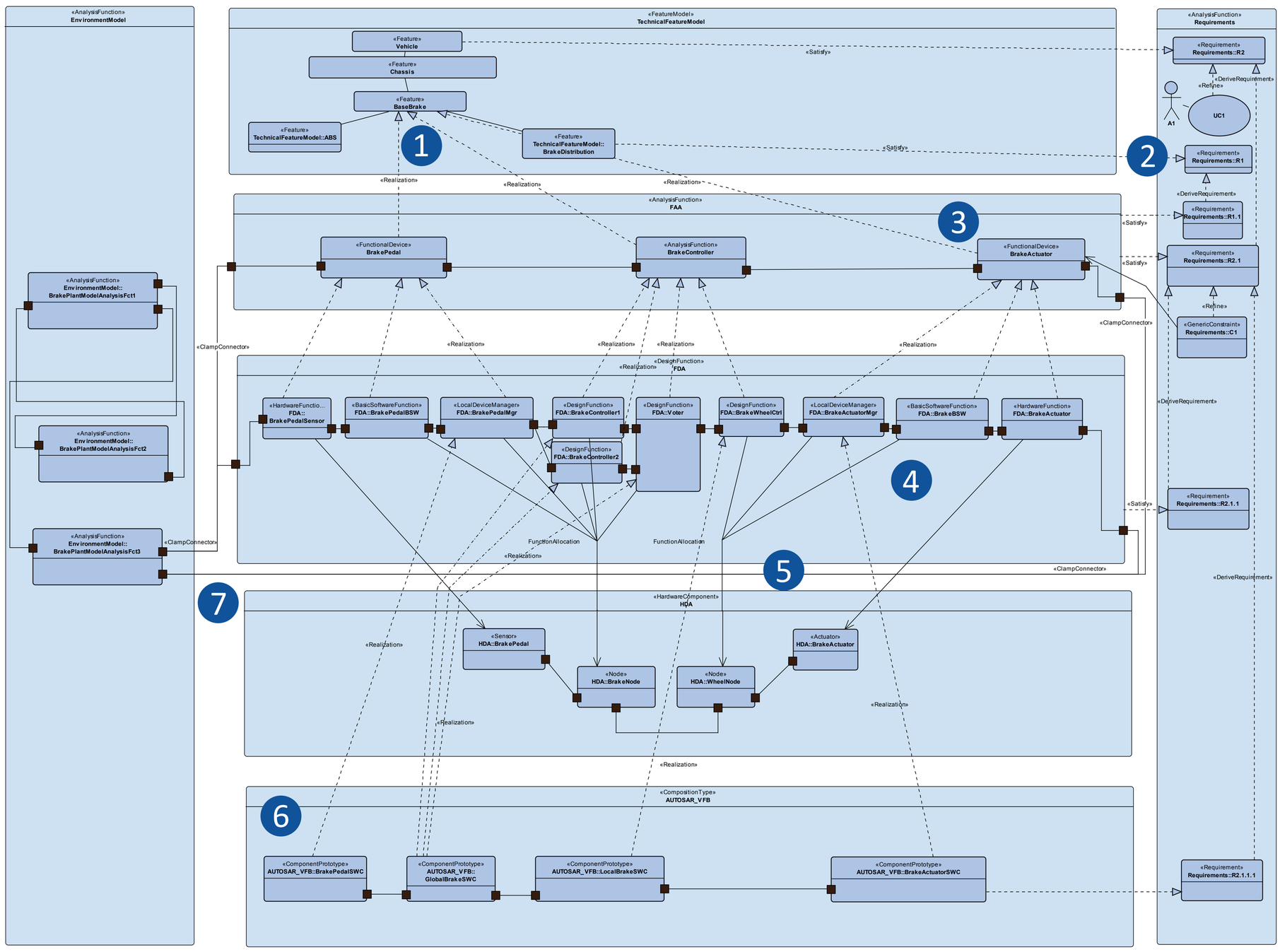
On Vehicle Level, the feature model represents the externally visible properties of the vehicle.

On Analysis Level, the abstract functional definition of the vehicle systems is captured, to allow analysis of vehicle content independently of detailed design.

On Design Level, the design architecture represents the detailed design of the functional content and hardware.

The Implementation Level is based on AUTOSAR, and thus contains the software architecture and target hardware.

The Environment Model captures the surrounding environment including vehicle mechanics and external systems. This model is common to all abstraction levels, as the external environment is the same, regardless of representation of the EE architecture. Sensors and actuators on the respective abstraction level serve as interface to the environment model.



1 Entities on a lower abstraction level are realizations of entities on the higher levels. This is modelled and traced.

2 Requirements can be allocated to any entity in the model. Requirements can be derived to more detailed requirements or refined to constraints or models.

3 Algorithms and functionality as well as interactions with the environment are represented in a hardware-independent way on Analysis Level

4 Transfer functions and abstract aspects of middleware and platform and hardware components are represented by BasicSoftwareFunctions and HardwareFunctions respecitvely. DesignFunctions and Local-DeviceManagers represent application functionality for regular applications and sensor/actuator interfacing respectively.

5 Functional elements of the FunctionalDesign-Architecture are allocated to components on the HardwareDesignArchitecture. For example, a hardwareFunction may be Allocated to a sensor and a LocalDeviceManager to an Node.

6 Software Architecture is represented using AUTOSAR elements

7 The EE System model on the respective abstraction level is connected to a shared environment model using ClampConnectors that can go beyond the component boundaries.