

# TRANSPORTATION & MOBILITY EMBEDDED ELECTRONIC ARCHITECTURE

Define, develop & manage automotive embedded systems



## EMBEDDED SYSTEMS ARCHITECTURE

80% of all new vehicle innovations are implemented through embedded electronic systems. In parallel, the technology upgrade cycle of existing vehicle systems continues to decrease. This continuous evolution makes it increasingly complex to define and manage the distributed architecture of automotive embedded systems.

The Embedded Electronic Architecture (EEA) solution from Dassault Systèmes accelerates the design, development and lifecycle management of automotive embedded systems.

### Embedded systems development process.

Developing Embedded Electronic (EE) systems is a complex multi-discipline process that starts with the initial definition of system functions and continues through to their detailed implementation.

The process involves the specification, allocation, development and validation of system functions that are implemented through a combination of hardware, software control systems and communication networks. This process is further exasperated by the need to manage the lifecycle of all systems assets and their

relationship to each other across multiple vehicle programs and variants.

### Manage and collaborate throughout the process.

The Embedded Electronic Architecture (EEA) solution from Dassault Systèmes is designed to address these challenges. It delivers a rich integrated environment to manage the development of complex embedded systems. The solution provides a single source of truth for all vehicle electrical, electronic and software engineering data and enables all stakeholders to effectively collaborate throughout the entire systems development process.

### Define and allocate system requirements.

EEA facilitates the allocation and validation of systems functions by allowing users to create, view & edit systems requirements, set their configuration effectivity and create complex relationships from these requirements to other system objects and assets.

### Allocate system functions.

Powerful capabilities are provided for the embedded systems architect to efficiently decompose and manage both customer orderable features (e.g. cruise control) and technical functions that need to be implemented for effective vehicle operation (e.g. engine temperature control). The architect can:

- Create & search the unified systems database for features and functions to be implemented, their data flows, input / output port definitions and then create the necessary sub-functions and their interfaces,
- Define applicable system configurations and the effectivity of individual functions, signals and ports,
- Automatically generate functional architecture definitions from external model based design files (e.g. Simulink files).

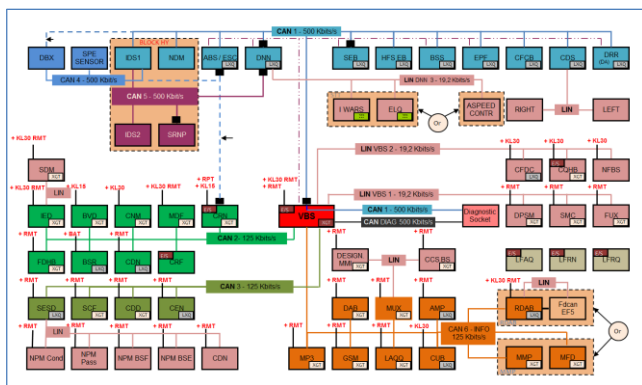
### Design and manage software components.

EEA enables software architects to design software components along with their associated input / output ports and port-interfaces. The EEA design concept used is the same as that defined by the AUTOSAR standard –

where users create AUTOSAR specific software architectures that support both functional and hardware architectural designs. EEA can also export embedded software architecture designs to AUTOSAR compliant development tools.

### Design and manage hardware topology.

Hardware topology definition enables the EE architect to define the implementation of the embedded systems network topology: Electronic Control Units (ECUs), sensors, actuators, communication ports & buses, CAN, LIN, FlexRay network elements, electrical wires and manage communication signals.

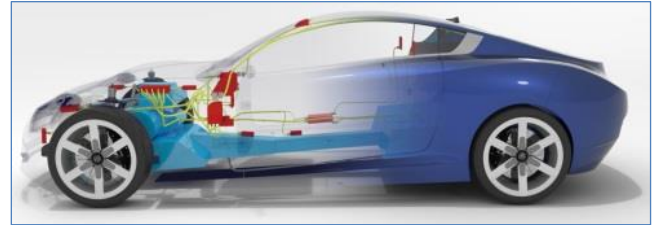


### Allocate functions and evaluate performance.

Allocate functions and data flows from functional (or software) architecture definitions to system components and the EE interfaces of a given hardware architecture and its associated components. When all functions and data flows are fully allocated, it is then possible to evaluate the overall performance of the resulting EE architecture.

### Generate system documentation.

Automatically generate customized system, sub-system and component definition reports and specifications for sharing with partners and suppliers.



### Business benefits delivered.

- Enhanced system asset reuse enabled by a powerful model-based embedded system development process.
- Increased productivity through rich collaboration and data sharing enabled by the powerful 3DEXPERIENCE platform that accelerates all systems engineering activities.
- Reduced time and effort to define and partition system functions, allocate them to hardware and software component designs, network topology and communication matrices.
- Improved ability to quickly and easily evaluate design alternatives and reuse system assets across multiple product lines through powerful system configuration management capabilities.
- Enhance communications and collaboration with suppliers and partners through the early generation of detailed sub-system and component specifications.

## Our 3DEXPERIENCE® platform powers our brand applications, serving 12 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the 3DEXPERIENCE® Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 190,000 customers of all sizes in all industries in more than 140 countries. For more information, visit [www.3ds.com](http://www.3ds.com).



**Americas**  
Dassault Systèmes  
175 Wyman Street  
Waltham, Massachusetts  
02451-1223  
USA

**Europe/Middle East/Africa**  
Dassault Systèmes  
10, rue Marcel Dassault  
CS 40501  
78946 Vélizy-Villacoublay Cedex  
France

**Asia-Pacific**  
Dassault Systèmes K.K.  
ThinkPark Tower  
2-1-1 Osaki, Shinagawa-ku,  
Tokyo 141-6020  
Japan