Introduction

OMG Systems Modeling Language™ (OMG SysML™) is an enabler of a Model-Based Systems Engineering (MBSE) approach to improve productivity, quality, and reduce risk for complex systems development. SysML is being used as part of an MBSE approach by a broad range of industries including aerospace and defense, automotive, and biomedical. SysML is a general-purpose graphical modeling language for specifying, analyzing, designing, and verifying complex systems that may include hardware, software, information, personnel, procedures, and facilities. The system model expressed in SysML provides a cross-disciplinary representation to enable integration with other engineering models and tools as seen in the figure below.

The Object Management Group® (OMG®) is an international, open membership, not-for-profit technology standards consortium, founded in 1989. OMG standards are driven by vendors, end-users, academic institutions, and government agencies. The OMG and the International Council on Systems Engineering (INCOSE at www.incose.org) collaborated on the standardization process to extend the Unified Modeling Language® (UML®) to support the needs of the systems engineering community. SysML is a subset of UML with extensions to satisfy the specific needs of systems engineers.

The System Model in SysML enables integration with other engineering models and tools.
1. The “block” is the basic unit of **structure** in SysML and can be used to represent hierarchy, interconnection, and variants of systems that include hardware, software, facilities, personnel, or any other system element.

2. SysML represents **behavior** in various ways using activities, interactions, and state machines. SysML extends activities to represent continuous flows and support for enhanced functional flow block diagrams.

3. The **parametric** diagram represents constraints on property values such as performance, reliability, and mass properties, and provides a means to integrate the specification and design models with engineering analysis models.

4. SysML represents text-based **requirements** that can be related to other model elements to support traceability from requirements to design, analysis, and test. This capability provides a bridge between the typical requirements management tools and the system models.

5. SysML also includes an allocate relationship to represent various types of **allocation**, including allocation of functions to components, allocation of logical to physical components, and allocation of software to hardware.

In addition, SysML leverages the OMG’s XML Metadata Interchange™ to exchange modeling data between tools.

More information on SysML can be found on the SysML website (www.omgsysml.org), and more information on MBSE can be found on the MBSE Wiki (www.omgwiki.org/MBSE/doku.php).

**Want to learn more?**

We are happy to discuss how OMG membership will benefit your organization! Please feel free to explore our website at www.omg.org and when you are ready, please contact bd-team@omg.org or call +1-781-444-0404 to get started.

**About OMG**

OMG Task Forces develop enterprise integration standards for a wide range of technologies and an even wider range of industries. OMG’s modeling standards enable powerful visual design, execution and maintenance of software and other processes. Visit www.omg.org for more information.

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