SysML 2.0 – Changes of Interest – 1.x to 2.0

Kernel Modeling Language (KerML)

Version 1.0
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Submitted in partial response to Systems Modeling Language (SysML®) v2 RFP (ad/2017-12-02) by:

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As required in the SysML v2 RFP, the abstract syntax for KerML is defined as a model that is consistent with the OMG Meta Object Facility (MOF) as extended with MOF Support for Semantic Structures (SMOF) (see 7.1.4). This also allows KerML models represented in the KerML abstract syntax to be interchangeable using OMG XML Metadata Interchange (XMI).

The OMG MOF standard has been used to define many OMG-standardized modeling languages, and the KerML language definition is also built on it. However, MOF and XMI only standardize the means for specifying the abstract syntax of a modeling language and interchanging models so specified. Even SMOF provides only limited additional support for the syntactic structures required for so-called "semantic" languages.

The goal of KerML is to go beyond this and to become a new OMG standard providing application-independent syntax and semantics for creating more specific modeling languages (as described further in Clause 1). This will allow not only syntactic interchange between modeling tools, but also semantic interoperability. The KerML specification is being submitted as part of the SysML v2 submission, because the SST has built SysML v2 on KerML in exactly this way.

9 Model Interchange

KerML models may be interchanged between conformant KerML modeling tools (see Clause 2) using text files in any of the following formats:

1. Textual notation, using the textual concrete syntax defined in this specification. Note that in certain limited cases, models conformant with the KerML syntax, but prepared by a means other than using the KerML textual concrete syntax, may not be fully serializable into the standard textual notation. In this case, a tool may either not export such model at all using the textual notation, or export the model as closely as possible, informing the user of any changes from the original model.
2. JSON, using a format consistent with the JSON schema based on the KerML abstract syntax, consistent with the REST/HTTP platform-specific binding of the Element Navigation Service of the Systems Modeling API and Services specification [SysAPI].
3. XML, using the XML Metadata Interchange (XMI) format based on the MOF-conformant abstract syntax metamodel for KerML.

Every conformant KerML modeling tool shall provide the ability to import and/or export (as appropriate) models in at least one of the first two formats.

Submission Note. Model interchange will be addressed more fully in the revised submission. Issues to be addressed include interchanging tool-generated metadata (such as Element identifiers) in the textual notation and full documentation of the JSON format.