**SysML/AADL Translator for Enterprise Architect**

The SysML to AADL translator translates system architectural models specified in a subset of the Systems Modeling Language (SysML) to models specified in a subset of the Architectural Analysis and Description Language (AADL). SysML is an open standard published by the Object Management Group (OMG) for the specification of system architectures. AADL is an open standard published by the Society of Automotive Engineers (SAE) for the specification of system architectures for embedded systems.

The SysML models are created using the Sparx Systems Enterprise Architect® (EA) tool and then exported as an Extensible Markup Language (XML) Metadata Interchange (XMI) file using the export option provided by EA. The translator currently supports the 2.1 version of XMI. A SysML profile for AADL extends SysML with constructs commonly used in AADL. These include AADL component categories such as system, process, thread, data, device, processor, bus and memory and AADL features such as port, data access, and bus access. These constructs are provided on an AADL toolbar palette in Enterprise Architect to simplify the development of SysML models that can be translated to AADL.

The SysML translator only translates a subset of the SysML constructs. A mapping of SysML constructs and the AADL constructs to which they translate is shown in Table 1.

The translator is invoked from within the OSATE (Open Source Architectural Tool Environment). OSATE is an open-source Eclipse-based framework for constructing and analyzing AADL models. The translator is written in the Java programming language and is packaged as plug-ins for the Eclipse development environment containing Java source code, executable byte code, and supporting XML files. It can be installed using the standard Eclipse facilities for installing new software. Once installed, new menu items are provided to the OSATE user to import a XMI-based XML model generated by the SysML tool to generate an AADL model.

The distribution contains the Java source for the translator, the EA AADL profile for SysML, a User’s Manual, a Developer’s Manual, an example SysML model (the Pilot Flying example), an Eclipse P2 update site containing the translator binaries, and installation instructions.

Table 1 - SysML to AADL Objects

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| --- | --- |
| **SysML Structure** | **AADL Object** |
| Block | ComponentType |
| Block as a Client in Realization Relation | ComponentImplementation |
| Flowports | Ports |
| Binding Connector | Connection |
| SysML part (block property) | Subcomponent |
| State | Boolean variable in an AGREE annex |
| Transition | Boolean variable in AGREE |
| Transition Guard | Boolean expression (in transition) |
| Transition Action | Guarantee in a ComponentType  Assertion in a ComponentImplementation |
| Tagged Value | AADL property |