

# Integrating ASTD in the Rodin platform

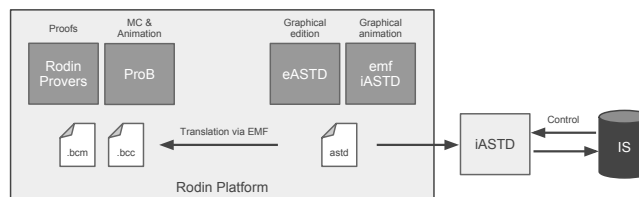
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**Abstract.** The ASTD notation is a graphical modeling language associated with formal semantics. It can be used to describe process and information system (IS) behaviors. By executing such specification with an interpreter, an IS controller can verify that executed actions comply with the model of the formal system. ASTD main disadvantage is currently its lack of tools. Ongoing works try to address this issue.

The Algebraic State Transition Diagrams notation, or ASTD [3] offers a graphical and formal representation for processes. Based on automata, Statecharts and EB<sup>3</sup> process algebra, the ASTD notation combines advantages of each approaches. But in practice, a designer has to write a text representation of an ASTD structure in order to use it with *i*ASTD [5], an interpreter for ASTD.

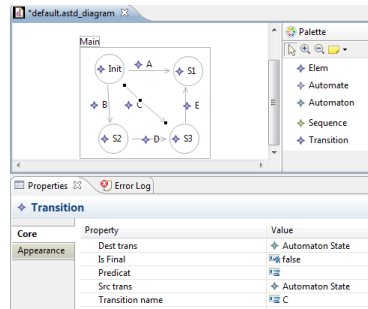


**Fig. 1.** A view of target architecture for ASTD integration in the Rodin Platform.

The ASTD notation can currently be used in three ways: interpreted with *i*ASTD and translated to Event-B and from EB<sup>3</sup>. *i*ASTD is already implemented, with optimization to improve speed of execution and persistence using a relational database. Event-B and EB<sup>3</sup> translation only exists as theoretic translation rules with no stand alone tool. In order to build a common ground for these translation processes, and to give to the ASTD notation a decent editor, it was chosen to develop a Rodin plug-in that will integrate tools and rules available for the ASTD notation. Fig. 1 presents the target architecture of such integration.

eASTD, an ASTD graphical editor, is currently being developed at GRIL, Université de Sherbrooke as a plug-in for Eclipse/Rodin. It is based on GMF [2],

the graphical modelling framework upon EMF [1]. An ASTD EMF meta-model has been produced and the graphical editor is currently being build (Fig. 2).



**Fig. 2.** A screenshot of an early version of eASTD plug-in inside Eclipse Platform.

The goal for eASTD is to integrate to the Rodin platform by allowing someone to design an ASTD specification and then to translate it systematically into Event-B contexts and machines [4] in order to perform proofs and model checking, using other Rodin plug-ins such as ProB. It will also be possible to exports ASTD graphical specifications into text specifications compatible with *i*ASTD. As a future work, we would like to integrate *i*ASTD as a Rodin plug-in in order to provide animation. Using benefits from graphical representation of ASTD and colored token moving while executing actions, it would be easier to validate an ASTD specification while constructing them.

If our proposal is accepted, we would like to present to workshop attendees the difficulties we encountered and how we solve them while developing eASTD plug-in and share our translation mechanisms from ASTD to Event-B.

## References

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