ATL: the ATLAS Transformation Language

Presentation of ATL

ATL is the ATLAS INRIA & LINA research group answer to the OMG MOF/QVT RFP. It is a model transformation language specified both as a metamodel and as a textual concrete syntax. It is a hybrid of declarative and imperative. The preferred style of transformation writing is declarative, which means simple mappings can be expressed simply. However, imperative constructs are provided so that some mappings too complex to be declaratively handled can still be specified. Once complex mappings patterns are identified, declarative constructs can be added to ATL in order to simplify transformation writing.

An ATL transformation program is composed of rules that define how source model elements are matched and navigated to create and initialize the elements of the target models.

The work on ATL is a collaboration between the University of Nantes and INRIA and initially with TNI company. ATL has been chosen as the model transformation technology for the "ModelWare" IST European project in collaboration with SINTEF (Norway). It is currently being used by several research groups working in different domains and also for teaching.

The ATL execution engine architecture

A model-transformation-oriented virtual machine has been defined and implemented to provide execution support for ATL while maintaining a certain level of flexibility. As a matter of fact, ATL becomes executable simply because a specific transformation from its metamodel to the virtual machine bytecode exists. Extending ATL is therefore mainly a matter of specifying the new language features execution semantics in terms of simple instructions: basic actions on models (elements creations and properties assignments).

This flexibility is important for two main reasons: ATL will need to be aligned with the QVT standard when it is adopted in 2005 and, as a research project, it can this way easily benefit from newly defined features.

Available developing tools for ATL

An IDE has been developed for ATL on top of Eclipse: ATL Development Tools (ADT). It uses EMF, the Eclipse Modeling Framework, to handle models: to serialize and deserialize them, to navigate and to modify them. A specific code editor, including syntax highlighting and an outline view of the program, is implemented as a convenience.

This IDE also includes a specific ATL extension of the Eclipse debugging framework enabling source-level debugging of transformation programs. Single step, step over and breakpoints support makes it possible for the developer to precisely control the execution of the transformation program being written. When the execution is suspended, it is possible to navigate into source and target models from the current context as well as into user-defined variables. ADT is about to be released as part of the Eclipse GMT project under the EPL (Eclipse Public License).

Contact information

Send a mail to atl-contact@univ-nantes.fr to request ATL mailing-list membership or any additional information. The ATL web site can be found at http://www.sciences.univ-nantes.fr/lina/atl/. The GMT web site, on which ATL is going to be released as an open source subproject, is located at http://www.eclipse.org/gmt/.