

AndroMDA

By

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 - 2 What is AndroMDA?
 - 3 What can AndroMDA do for me?
 - 4 MDA and code generation.
 - 5 How does AndroMDA works?
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 - 7 How does AndroMDA compare to other tools?
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Introduction to MDA

Background

In 1995, Mary Loomis led the OMG members in further enlarging their vision to include object modeling. This resulted in the adoption of the Unified Modeling Language, UML. OMG members then began to use UML in the specification of technologies for OMG adoption

In keeping with its expanding focus, in 2001 OMG adopted a second framework, the Model Driven Architecture or MDA. MDA is not, like the OMA and CORBA, a framework for implementing distributed systems. It is an approach to using models in software development

MDA is another small step on the long road to turning our craft into an engineering discipline

Introduction to MDA Cont'

Overview

The Model-Driven Architecture starts with the well-known and long established idea of separating the specification of the operation of a system from the details of the way that system uses the capabilities of its platform

MDA provides an approach for, and enables tools to be provided for

- specifying a system independently of the platform.
- specifying platforms and choosing a particular platform for the system, and transforming the system specification into one for a particular platform.

The three primary goals of MDA are:
portability, interoperability and reusability
through architectural separation of concerns

Introduction to MDA Cont'

The Basic Concepts

System	Model	Model-Driven
Architecture	Viewpoint	View
Platform	Application	Platform Independence
MDA Viewpoints	Computation Independent Model	<i>CIM</i>
Platform Model	Platform Independent Model	<i>PIM</i>
<i>Transformation</i>	Platform Specific Model	<i>PSM</i>
Implementation	Model Pervasive Service	

for more details about any of the above ones see
The Introduction to MDA provided by OMG

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What is AndroMDA?

In short, AndroMDA is an open source MDA framework it takes any number of models (usually **UML** models stored in **XMI** produced from case-tools) combined with any number of andromda plugins (**cartridge** and translation-libraries) and produces any number of custom components.

You can generate components for any language you want, Java, .Net, HTML, PHP, anything All you need to do is just write or customize existing cartridge to support it and you're good to go



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What AndroMDA can do for me?

AndroMDA is mostly used by developers working with J2EE technologies. Out-of-the-box AndroMDA can setup a new J2EE project from scratch, in which code is generated from a UML model. You can choose to generate code for Hibernate, EJB, Spring, WebServices, and Struts. The generated code is automatically integrated into the build process. In doing so you will only need to spend a little time getting to know AndroMDA and you're good to go, you will see it is very efficient to have the code generated for you, while keeping your focus on business logic.

Additionally AndroMDA ships with a few tools to make your life easier:

- As already mentioned, we have a tool to generate project templates such as for J2EE: **andromdapp:generate**, this is a maven Plugin
 - **Schema2XMI** is able to read your database and build an **XMI file** from it, which can then be used to load as a UML model.
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MDA and Code generation

In the classical sense of software engineering, one first determines what the system needs to do (the analysis phase). In this step the developer or architect has something in mind that will eventually be translated into a formal and platform specific system, it will require an actual person to implement this translation using a language such as ASM, C, C++, Java

With MDA we attempt to simplify the job of the developer and architect, we achieve this by making it easier for him/her to digitalize the ideas he/she has in mind (the Mental Model or MM): we let him/her create the Platform Independent Model or PIM , this model is a one-or-one mapping of the MM into a more formal language such as UML.

MDA and Code generation Cont'

This approach has several obvious advantages:

- It is a very straightforward translation process
- The developer/architect keeps focus on the business logic, not the underlying technology
- The PIM can be reused later, it is not bound to any existing platform
- The PIM is a useful medium to communicate ideas to others

The next step is to have a way to transform the PIM into program code, the MDA way of doing this is to gradually refine the model into a more Platform Specific Model or PSM and marshal this model into the code that would actually be written manually.

MDA and Code generation cont.

This is where AndroMDA kicks in: different cartridges exist that will analyze the given PIM and construct a PSM with which templates are used to produce code.

A very important thing to know about AndroMDA is that the transformation process is controlled using Plug-ins called cartridges and each cartridge is very easy to tune.

Any type of customization is possible, therefore you won't get stuck.

On the other hand it is very important to realize AndroMDA is here to help eliminate boring and repetitive tasks, while at the same time allowing your model to really communicate what the system is doing. it is not meant be a Silver Bullet solution where the computer takes over your job and you just sit back and stop thinking.

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How does AndroMDA works?

- AndroMDA reads models into memory making these object models available to its plugins.
- These Plugins define exactly what AndroMDA will and will NOT generate. Each Plugin is completely customizable to a project's specific needs.



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Why we need AndroMDA?

You would want to use AndroMDA for a number of reasons:

1. It eliminates the need to write redundant code.
 2. Your project models WILL reflect your code.
 3. Projects are documented/diagrammed in a standard platform independent way making it much easier/faster to adapt to ever rapidly changing technologies.
 4. You'll have artifacts (your models) that allow much easier communication with the business side of things.
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How does AndroMDA compare with other tools

As opposed to other MDA tools we are not spending our time and effort promoting this free software product, neither are we trying to attract developers using catchy slogans or aggressive sales tactics. Instead, we let the product speak for itself, we believe that a great product can only be achieved when strict criteria are met!

This is what AndroMDA guarantees:

- 1 Community Driven.
 - 2 Vision.
 - 3 Pragmatic.
 - 4 Open.
 - 5 Modular.
 - 6 Doc.
 - 7 Responsiveness.
 - 8 Release Often.
 - 9 Testing.
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Sample Application

Application:

Exam Results or any other suggestion.

Requirements:

1. Java
 2. Maven/Ant
 3. JBOSS/TOMCAT
 4. MagicDraw, Posidon, Or Arguml.
 5. Create a file at your home directory, called `build.properties` and add the following line in there:
`maven.repo.remote=http://www.ibiblio.org/maven,http://team.andromda.org/maven`
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Sample Application Cont.

Environment variables: (Windows)

JAVA_HOME Java installation directory, eg. `C:\j2sdk1.4.2_08` .

MAVEN_HOME Maven installation directory, eg. `C:\apps\maven` , this might have already been set by the Maven installer.

JBOSS_HOME JBoss installation directory, eg. `C:\apps\jboss-4.0.1sp1` .

CATALINA_HOME Tomcat installation directory, eg. `C:\apps\jakarta-tomcat-5.5.9`.

PATH This makes sure the system will search for console commands in the directories listed here. If this property already exists you should simply add `%JAVA_HOME%\bin;%MAVEN_HOME%\bin` .

Sample Application Cont.

Environment variables: (Linux)

JAVA_HOME=/usr/java/jdk1.5.0_06

MAVEN_HOME=~/.maven-1.0.2

MAVEN_OPTS=-XX

PATH=/home/aabelaziz/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/bin/X11:/usr/games

PATH=\$PATH:\$JAVA_HOME/bin:\$MAVEN_HOME/bin

export PATH JAVA_HOME MAVEN_HOME

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Frequently Asked Questions FAQ

Q: My company likes our DBA to design our database Is there any way that I can generate a model from existing schema?

A: Yes there's a AndroMDA utility called Schema2XMI that will do exactly that.

Q: I have a large model and it takes a while for AndroMDA to process everything, is there anyway to speed things (i.e. selecting only certain cartridges to run against my model)?

Yes, you can filter the cartridges you want to run against your model by using the **maven.andromda.cartridgeFilter** property (when using the AndroMDA Maven Plugin) or the **cartridgeFilter** attribute (when using the AndroMDA Ant task).

Frequently Asked Questions FAQ

Q: Is the purpose of AndroMDA is to generate my complete application?

A: maybe that will be possible in the future :-)) but not yet for now. If you are tired of writing the same code all the time, updating XDoclet tags, etc... and you want to keep focus on the business, AndroMDA is for you.

For users not familiar with AndroMDA, here's an approximation of the percentage of code generated:

- * Persistence (EJB/Hibernate): 100%
 - * Business (EJB): 30%
 - * WebServices (Axis): 100%
 - * Presentation (Struts): 80%
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