

SCXML GSoC2010EclipsePluginProposal

An Eclipse-based Visual State Chart XML editor/debugger that generates SCXML documents

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Organization/Project:Apache/Commons SCXML

Assigned Mentor: not yet

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Proposal Abstract:

State Chart XML (SCXML) provides a generic state-machine based execution environment based on Harel State Tables. It is very useful to handle complex status transfer logic, but if a SCXML file is really so huge and complex, it will become too difficult to maintain and refactor or to test its logic validity. This project aims to provide a Eclipse and GMF based Visual Editor and Debugger for SCXML, and we can also use it to generate SCXML document and specific codes according to a State Chart XML.

Detailed Description:

[State Chart XML](#) is very useful to handle complex status transfer logic. [Commons SCXML](#) is an implementation aimed at creating and maintaining a Java SCXML engine capable of executing a state machine defined using a SCXML document, while abstracting out the environment interfaces. Now, more and more developers use it to help handle complex program logic, but editing a State Chart XML is so boring and mistakable. If a SCXML file is really so huge and complex, it will become too difficult to maintain and refactor or to test its logic validity. For example, if a SCXML flow has more than 20 States, it is possible to form a dead loop due to developer's glitch. In fact, the archives of the Apache Commons SCXML user mailing list will show many queries asking for it over the years. Obviously, [Eclipse](#) is the most powerful and popular Integration Development Environment for developers, if it supplies an editor or even debugger for State Chart XML, isn't it cool?

In fact, an open-source Eclipse-based plugin that uses visual state chart editors and generates SCXML documents is much needed – the archives of the Apache Commons user mailing list show many queries asking for it over the years. And SCXML committers told me it is a good topic for an open source and GSoC endeavor.

This project aims to develop an [GMF](#) based Eclipse plug-in visual editor which is capable of showing a graphical representation of the process model and allows for adding breakpoints to activities, variable modifications and managing the debugging process for SCXML. I have already done some work on both SCXML and Eclipse GMF, even I tried to implement a SCXML editor using GMF and got a little achievement, so I want to develop this editor with GMF and have enough confidence to finish it.

Usually, State Chart XML files will be running on a SCXML engine, such as our Commons SCXML, if someone only wants to achieve the SCXML file's business logic, but does not want to or cannot use some SCXML engine due to some reasons (for example, some guys want to run scxml on a web page, but they cannot find [JavaScript](#) SCXML engine), this code generation module will leverage the Commons SCXML APIs and assume those jars are available. In my plan, I will implement Java, JavaScript, C++ and python support for it.

So, I want to mainly complete the following functions:

1. Create an Eclipse plug-in and GMF based Visual editor for SCXML. This editor can be used to add or edit State Chart Diagram by drag and drop operations, and users can modify State properties of SCXML in Eclipse's property view.
2. State Chart XML export function. State Chart Diagram can be saved as a SCXML file.
3. Implement debug function for the editor. This SCXML editor will integrate Apache Commons SCXML engine to run State Chart XML file, show context attributes and variables at the breakpoints. Implement step by step, state by state debug function.
4. Code generation function. I will finish Java code generation module. And in the future, this tool will be able to generate Java, C++, [JavaScript](#) and [Python](#) codes according to State Chart Diagram. But as we know, I have only more than two months to finish a GSoC project, so, I will hold this as a long term open source project under Apache, during this summer, I will finish Java code generation job. In the short run, I will implement [JavaScript](#), C++ and Python code generation jobs.

Additional Information:

Things I have done already:

I have been studying W3C's recommendation specification about SCXML, read some code generation related documents, subscribed Eclipse plug-in develop, GMF and Apache Commons SCXML mail list, discussed technology details in the mail lists. As GSoC suggested it, mail list is really a good place to discuss project ideas and some other details. I use the mail lists whenever possible to clarify my doubts by asking questions from the experts. Feedback that I received from mail lists helps me so much, thanks for self-giving open source developers and open source spirit.

If I want to start my project, background information about Eclipse plug-in and GMF is prerequisite. Fortunately, I have more than three years Eclipse plug-in development experience and am familiar with GMF. In fact, I have developed a GMF based SCXML editor rudiment already.

In order to implement code generation for Java, I must know well about Java code generation related theory. In fact, I have several years Java development experience, and so am familiar with it. So, in the future, I have confidence to do it well.

Time Schedule:

- March 29 - April 9: Submitting the project proposal
- April 26 - May 24: Community Bonding Period (April 26 - May 24): Get to know mentors, read documentation, and prepare development environment.

- May 25 - Jun 8: Implement GMF based basic visual editor for State Chart XML
- Jun 9 - Jun 16: Implement properties edit operations in Eclipse property view, finish SCXML file export function
- Jun 17 - Jun 24: Finish SCXML document export design job,including generation guidance UI design and generate system design
- Jun 25 - Jun 28:Finish SCXML document generation coding job
- Jun 29 - Jul 2:SCXML debugger design and validate
- Jul 3 - Jul 12: Integrate with Apache Commons SCXML engine, implement debugger function coding job
- Jul 13 -Jul 31: Design Java code generation module, finish Java code generation module
- Aug 1 - Aug 9: Write test cases to test generator,fix bugs do some improvement jobs
- Aug 10 -Aug 16: Scrub code, write tests, improve documentation, etc
- Aug 17 - Aug 20: Submit all my work

Something about me

My name is Xunlong Gui. My major is computer science and technology, and I am a postgraduate student of University of Science and Technology Beijing. I am familiar with Eclipse, Java, GMF, SCXML, XML, XSL and some other open source projects, such as struts, spring, jstl, dojo and so on and have several years of Java development experience. I am familiar with many projects in Apache Foundation, Eclipse Foundation as well as Dojo Foundation.

My e-mail is , and my mobile phone number is 861013488831434. When I was working in IBM China, my mentor helped me a lot and knew me well, if you are interested, my mentors may give you some impersonal evaluation about my ability and others. My mentor in IBM China Research Lab: Ping Pan/Email: panping@cn.ibm.com My mentor in IBM China Development Lab: Qian Liang/Email: liangq@cn.ibm.com

My open source development experience:

- Built a tool for struts2 to generate XML config file
- Develop a Eclipse plugin for Apache SCXML engine which was a visualizing tool for navigating and editing complex SCXML state description XML.

What I did in my student period

- 2005: Won China Computer World Scholarship (relative info: http://www.etiri.com.cn/publish/article_show.php?id=~26536529455)
- 2007.1 - 2009.7 : Work in IBM China Research Laboratory, my team focus on telecom J2EE solution, get lots of XML relative knowledge
- 2009.8 - 2010.3 : Work in IBM China Development Laboratory as a intern