SCiPX: Getting Started

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Abstract

The purpose of this document is to briefly introduce the SCiPX tool, to give some advices and prerequisites to be able to install it, then to show how to use it.

1 Introduction

SCiPX stands for SystemC to iP-Xact extraction tool. It takes as an input a SystemC-TLM [IEE05, Ayn09] design and produces the architectural view of this design in the IP-Xact [IPX] format linked to IP-Xact components definitions. It can also be seen as a partial IP-Xact packager for components. To do so, SCiPX relies on two different approaches. The first one uses the source code analysis tool Doxygen to produce the footprint of a SystemC components in the xml format. The second one uses a slightly modified version of SystemC 2.2 to stop the execution of a SystemC program, built from the SystemC design, exactly when the elaboration phase of the design is finished. Then, SCiPX merges the different informations in order to produce an IP-Xact model of the design and the different Components models used by the design. Further information about inner techniques can be found in the first paper about SCiPX [LTDS^{+}11] or in the French thesis [LT12].

2 Prerequisites

SCiPX is a C++ tool/library and can be found on the AOSTE team web page in the software section[1]. It has been tested with different linux ubuntu versions. Regarding the amount of works to simply test the installation process on not so different OS versions, no portability work is planned. So if you choose to give it a try on another OS, you are on your own. Otherwise, one can easily install one of the tested OS' in a virtual machine such as VMWare or VirtualBox(free)[2].

OS version	gcc version	usability
ubuntu-10.04-desktop-i386	gcc 4.4.1	OK
ubuntu 11.04-desktop-i386	gcc 4.5.2	OK
ubuntu 11.10-desktop-i386	gcc 4.6.1	KO

[1] www-sop.inria.fr/aoste/

[2] https://www.virtualbox.org

Why will not it work ? Actually, SystemC 2.2 do not compile anymore with the 4.6.1 version of gcc and newer. So do our slightly modified version.

Before starting to download the SCiPX sources, some steps are needed to prepare your OS to be able to compile SCiPX. As mentioned in Section 1, SCiPX relies on different already existing tools and libraries. Most important of them are embedded in SCiPX sources. Nevertheless, some dependencies should be installed before running the SCiPX installation script. Some of them are easy to install thanks to the "sudo apt-get install" command in a terminal, the last one is a bit tricky but doable.

Easy part:

```
user@host$ sudo apt-get install g++ flex bison
    libxerces-c-dev libpng++-dev
```

Hard part: At some step, SCiPX invokes Java codes, thus Java must be installed. The first tricky point is that SCiPX needs a specific version of Java jre/jdk, the official one.

```
user@host$ sudo apt-get install sun-java6-bin sun-
    java6-jre sun-java6-jdk sun-java6-plugin
```

Then, you have to force/update your system to use it.

```
user@host$ sudo update-java-alternatives -s java-6-
    sun
```

The second tricky point is it is no longer available/supported in the ubuntu 11.04 version. If you are in this case, there still is a solution. You need to update package repository using independent repository. Here is one working for ubuntu 11.04 version.

```
user@host$ sudo add-apt-repository ppa:ferramroberto/
    java
user@host$ sudo apt-get update
```

You now have to redo previous steps concerning the installation of Java. In both cases, if everything goes right, invoking the "java -version" command should give you the following result:

```
user@host$ java -version
java version "1.6.0_15"
Java(TM) SE Runtime Environment (build 1.6.0_15-b03)
Java HotSpot(TM) Client VM (build 14.1-b02, mixed
    mode, sharing)
```

3 Installation

If you followed previous steps and succeed in installing every dependencies, your system is ready to compile and run SCiPX. You can then download SCiPX[3] tarball and unzip it wherever you want to install it using:

[3] www-sop.inria.fr/aoste/

```
user@host$ tar xvzf SCiPX.tgz
```

Once the uncompress process is complete, the last thing remaining to do is to go to the SCiPX root directory and type:

```
user@host$ cd SCiPX
user@host$ ./install.sh
```

This installation script will compile the slightly modified version of SystemC 2.2, Doxygen and libs, uncompress different stuffs then will end by compiling SCiPX sources. If everything goes right (again), your terminal will display the message "installation done" and you are ready to use SCiPX.

4 Using SCiPX

As a starting point, user can go to the "example" directory, pick a random example and enter its directory. Then, user need to type "make" to generate the main binary containing the instantiation of a SystemC design linked to SCiPX library. The last thing to do is launching this binary ("./main") to produce the IP-Xact model of the design.

References

[Ayn09] Aynsley, John. OSCI TLM 2.0 Language Reference Manual, July 2009.

[IEE05] IEEE Standards Association. *Open SystemC Language Reference Manual.* Open SystemC Initiative, 2005. IEEE Std. 1666–2005.

[IPX] IP-Xact standard IEEE 1685. www.accellera.org/downloads/ieee.

[LT12] Jean-François Le Tallec. *Model extraction for System On Chip design.* PhD thesis, Université de Nice Sophia-Antipolis, France, 2012.

[LTDS$^+$11] Jean-François Le Tallec, Julien DeAntoni, Robert Simone, Benoit Ferrero, Mallet Frdric, and Laurent Maillet-Contoz. Combining SystemC, IP-Xact and UML-Marte in model-based SoC design. In *Proc. of the 2011 Workshop on Model Based Engineering for Embedded Systems Design*, M-BED'2011, Grenoble, France, March 2011.