Scicos-HDL

Zhangdong&Kangcai 2009.03
From China

http://scicoshdl.sourceforge.net
http://www.scilab.org.cn/scicoshdl/index

1/12 About SystemC

- SystemC is a C++ class library and a methodology that you can use to effectively create a cycle-accurate model of software algorithms, hardware architecture, and interfaces of your SoC (System On a Chip) and system-level designs.
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- You can use SystemC and standard C++ development tools to create a system-level model, quickly simulate to validate and optimize the design, explore various algorithms, and provide the hardware and software development team with an executable specification of the system.

2/12 About Scicos-HDL

- Scicos-HDL is a toolbox based on Scicos and SystemC, its main function is to generate Systemc code from Scicos model, and it supports co-simulation with the original blocks of Scicos and Scicos-HDL blocks.
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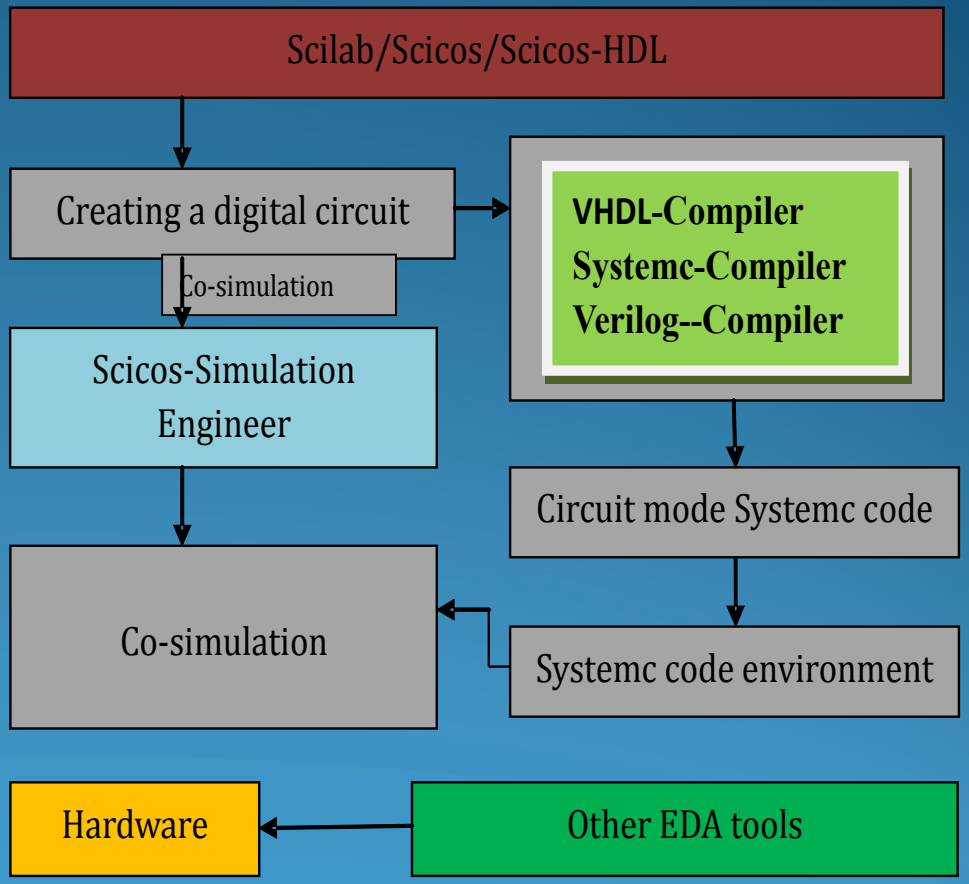
- Scicos-HDL links Scicos with hardware circuit design and simulate in SystemC code. Comparing to Scicos-HDL, the simulation engineer of Scicos-HDL is standard C++ language and SystemC library, this toolbox is more efficient.

3/12 Scicos-HDL Features

- Links SCILAB/SCICOS with SystemC library
- Automatically generates SystemC code
- Automatically generates a vcproject
- The new simulation engineer of Scicos-HDL uses compiled language, more efficient than Scicos itself.
- Supports SystemC, VHDL and VERILOG.
- Scicos hardware-acceleration function: the model file designed by Scicos-HDL can be compiled and downloaded to FPGA to run. Users can control which part running in FGPA and which part running in computer, so Scicos can use the software-hardware co-simulation.

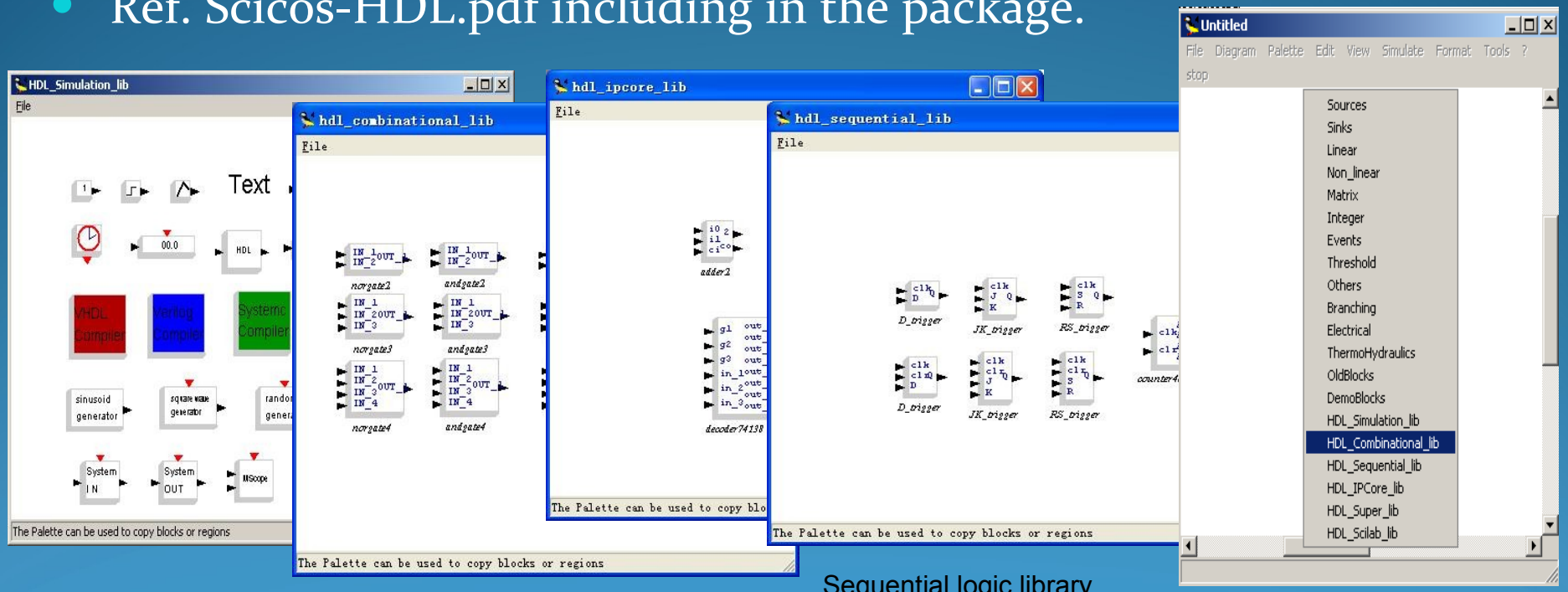
4/12 Design Flow

- Systemc-Compiler will generates the Systemc code of circuit and then start Scicos simulation engineer and meanwhile statt the Systemc environment to compile and run the whole mode project.



5/12 Install

- First , you should install Scilab, both in windows or Linux OS;
- Download the newest release of Scicos- HDL from here:
- **http://scicoshdl.sourceforge.net/**
- Ref. Scicos-HDL.pdf including in the package.



Digital system design basic library

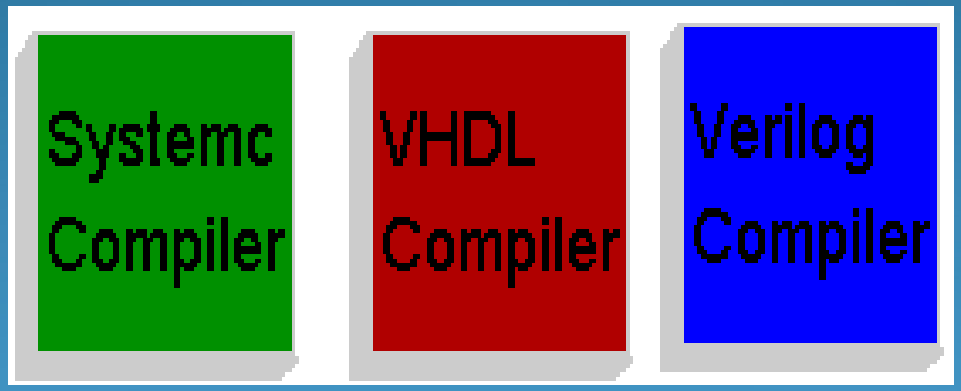
Combinational logic library

IP core library

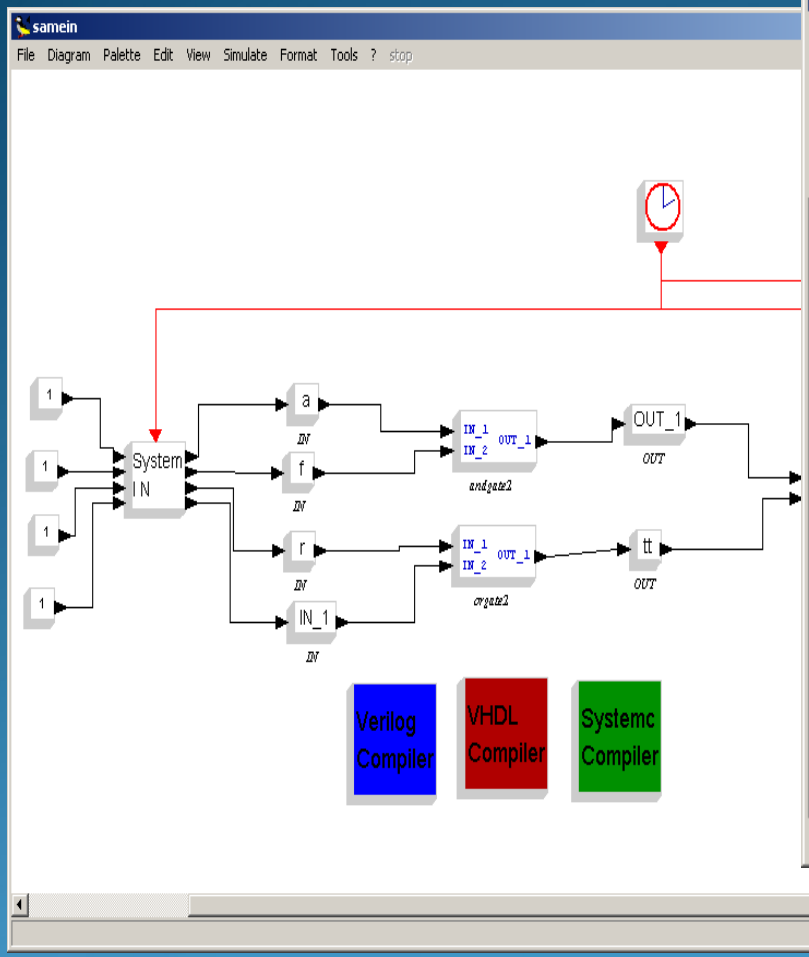
Sequential logic library

6/12 How to use Scicos-HDL

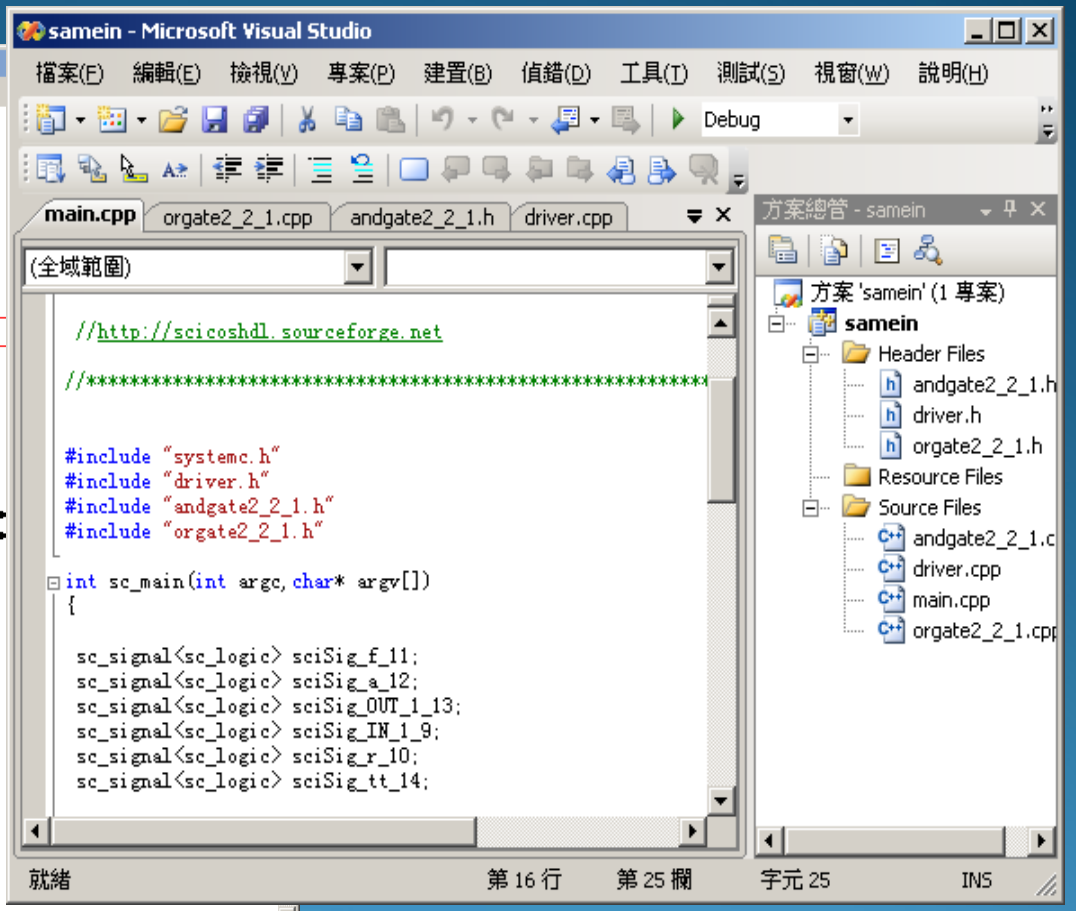
- All the using steps are as the same as the steps of Scicos, both for modeling and simulation;
- Just use the Scicos-HDL Compiler to generate HDL code;



7/12 Examples

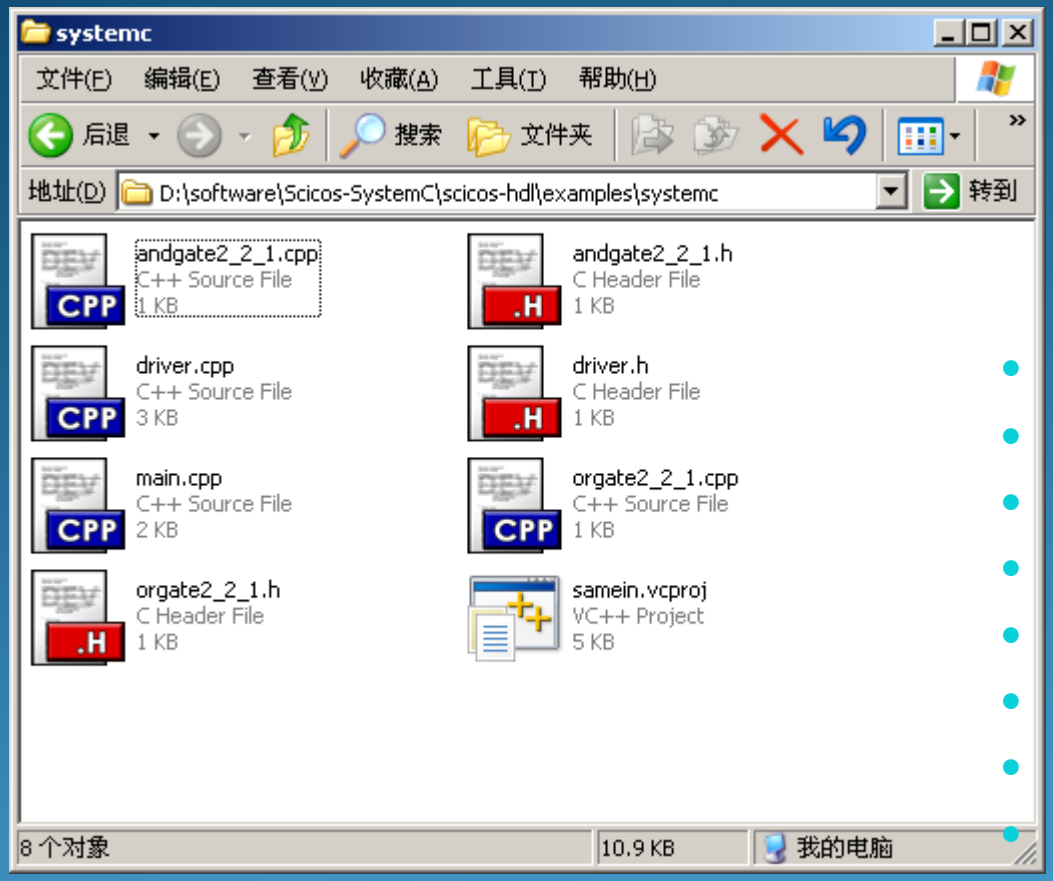


Scicos Model



Systemc Codes in VS2008

8/12 SystemC code file generated



- File Structure

files generated by Scicos-HDL

→ **samein.vcproj ------ project file**

→ **main.cpp ---------- main function**

→ **andgate2_2_1.h ----- and gate**

→ **driver.h ---------- simulation file**

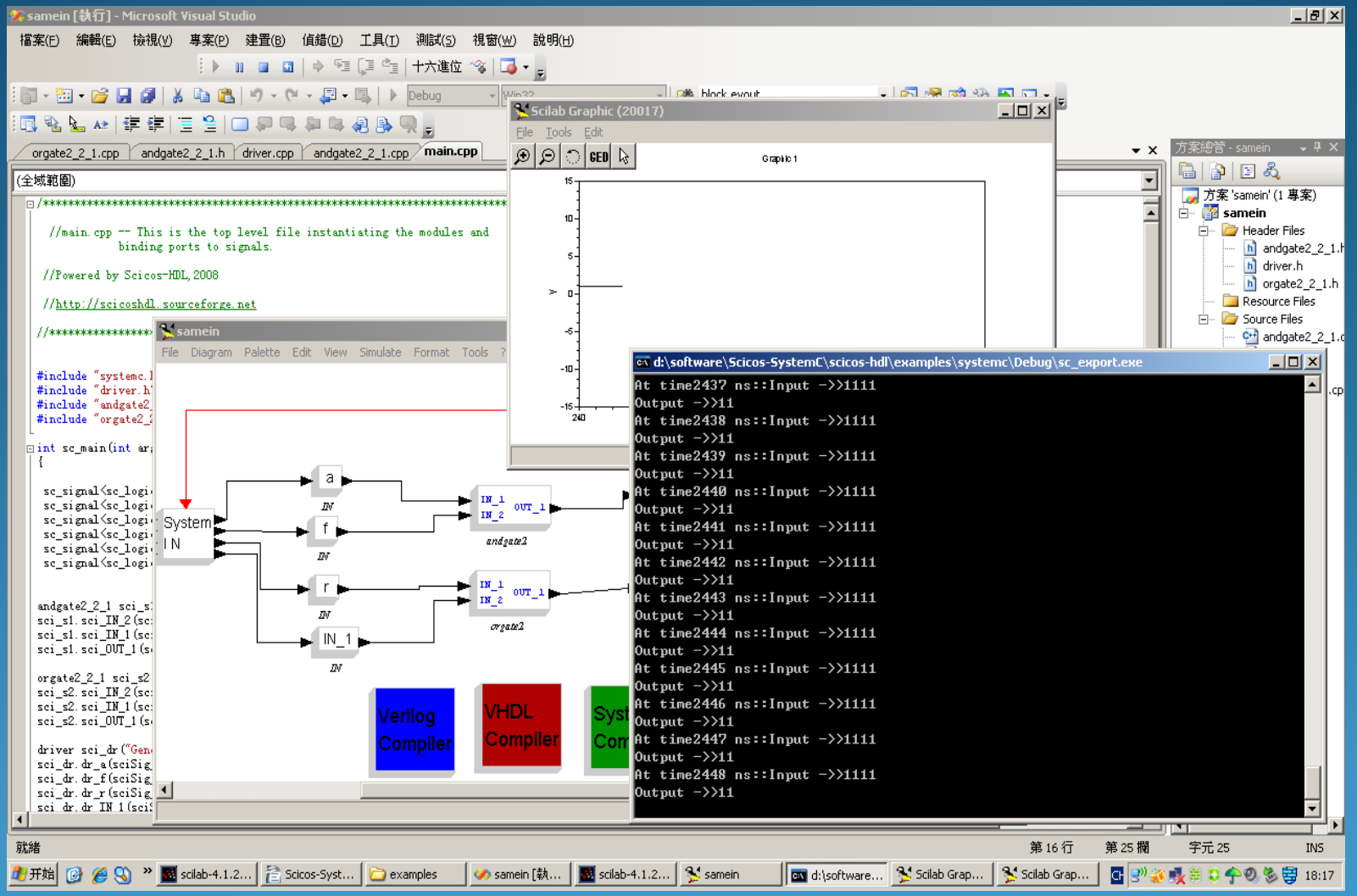
→ **orgate2_2_1.h ------- or gate**

→ **andgate2_2_1.cpp -- and gate**

→ **driver.cpp ---------- simulation file**

→ **orgate2_2_1.cpp ---- or gate**

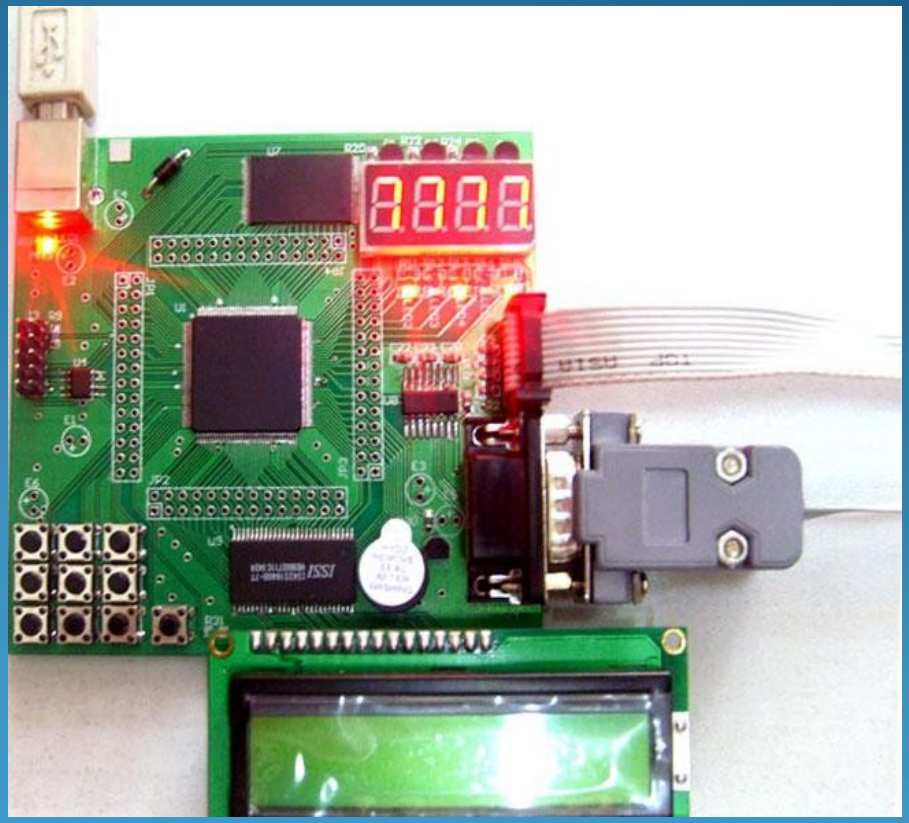
9/12 Co-Simulation



10/12 Hardware-acceleration

- function: the model file designed by Scicos-HDL can be compiled and downloaded to FPGA to run.

- Users can control which part running in FGPA and which part running in computer, so Scicos can use the software-hardware co-simulation.



Web Site: http://scicoshdl.sourceforge.net/

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11 Meaning

Project Email: scicoshdl@gmail.com

- Try out best to make Scicos-HDL as useful tool for the engineers;
- Enable Scicos automatically generate standard C++ cedes
- Enable Scicos support SystemC hardware description block
- Enable Scicos use software–hardware co-simulation

12 Main Application

- High Performance Scientific Computing area
- FPGA application design and simulation area
- ... ...

Thank you

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END