

SystemC V2.0.1 with Borland C++ Builder V5.0 - Console Application

Version 1.0

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1 INTRODUCTION

Currently, the release of SystemC V2.0.1 is supported on the following platforms:

- Sun Solaris 2.7 and 2.8 with GNU C++ compiler versions gcc-2.95.2 and gcc-2.95.3
- Sun Solaris 2.7 and 2.8 with SUN C++ compiler versions SC6.1 and SC6.2
- Linux (Redhat 6.2) with GNU C++ compiler versions gcc-2.95.2 and gcc-2.95.3
- Linux (Redhat 7.2) with GNU C++ compiler version gcc-2.95.3
- HP-UX 11.00 with HP C++ compiler versions A.03.15 and A.03.33
- Windows NT 4.0 (SP6a) with VC++ 6.0 (SP5)

In this document, a flow to support SystemC V2.0.1 with Borland C++ Builder V5.0 (SP1) is presented. This has been tested on Windows XP Pro (without SP1).

We will first discuss the steps to generate a Borland compatible SystemC library binary. Next, the details of running a SystemC design in a console application with Borland are shown. There are numerous issues surrounding this porting. It is hopeful that anyone who may have the solution(s) can email me at quekkh@pmail.ntu.edu.sg.

In the next release of this document, we will describe the steps for a SystemC design to interface with the Borland GUI components to create a visual application.

I would like to thank Mr Saurav Bhattacharyya for his time to review this document and test the flow. His generous comments have made this document complete.

2 GENERATING THE SYSTEMC V2.0.1 LIBRARY USING BORLAND C++ BUILDER

The original SystemC library source files <**systemc-2.0.1.exe**> downloadable in systemc.org contains the necessary (*.cpp) files, (*.h) files and example files. However, these files cannot be compiled using Borland Compiler or Borland C++ Builder.

SystemC_Win (http://www.geocities.com/SystemC_Win) has ported the original SystemC library source files to be compatible to Borland Compiler V5.5. The file <**SystemC2.0.1borland.zip**> can be downloaded at the systemc.org:

<http://www.systemc.org/download.php/contributions/21/28/SystemC2.0.1borland.zip>

In the following, we define the directory structure to ease the explanation of interfacing SystemC with Borland C++ Builder. Next, the steps to generate and setup the library binaries are discussed.

2.1 Directory Structure

We assume that the Borland C++ Builder is installed under **<C:\Program Files\>** and that the SystemC-Borland library source files are extracted to **<C:\SystemC\systemc2.0.1-src-borland\>**. We also extract the original SystemC library source files from **<systemc-2.0.1.exe>** into **<C:\SystemC\systemc2.0.1-src-original\>**. In addition, we will need to create a few directories. The overall directory structure is listed below.

```
C:\SystemC\
....systemc2.0.1-src-original\
    systemc-2 0 1\
        config\
        docs\
        examples\
        systemc\
            risc_cpu\
            ...
        msvc60\
        src\
....systemc2.0.1-src-borland\
    src\
        makefile mak
        systemc h
        systemc\
            communication\
            datatypes\
                bit\
                fx\
                int\
            kernel\
            tracing\
            utils\
....Include\
....Lib\
....Tutorial\
    risc_cpu\
    counter\
```

2.2 Generating the SystemC Library

Modify the make file **<C:\SystemC\systemc2.0.1-src-borland\src\makefile.mak>** manually as follows. You may experience compilation errors if you cut and paste the lines below into the make file. The double quotes (i.e. ") do not seem to paste correctly.

```
# borland root
# BCC55 = c:\borland\bcc55
BCC55 = "C:\Program Files\Borland\CBuilder5"
```

Next, open a Windows Command Prompt and change the directory to **<C:\SystemC\systemc2.0.1-src-borland\src\>**. For some systems, you may need to use "dir /x" to find the 8.3 filename (e.g. system~1.1-s) corresponding to the **<systemc2.0.1-src-borland>** directory. Type the following command:

```
C:\SystemC\systemc2.0.1-src-borland\src\> make > make.log
```

This will take a while to compile. When it completes, you will see additional files in **<C:\SystemC\systemc2.0.1-src-borland\src\>**:

- 77 OBJ files (you can delete all these intermediate files)
- systemc2.0.1.lib
- make.log (listed in Appendix A1 with 12 warnings)

2.3 Setting Up the SystemC Library

Copy the SystemC-Borland library binary **<systemc2.0.1.lib>** to **<C:\SystemC\Lib\>**. Similarly, copy all the header files (*.h) only in **<C:\SystemC\systemc2.0.1-src-borland\src\>** to **<C:\SystemC\Include\>**. The new directory structure is shown below.

```
C:\SystemC\  
....systemc2.0.1-src-original\  
....systemc2.0.1-src-borland\  
....Include\  
        systemc.h  
        .....systemc\*.h  
        .....communication\*.h  
        .....datatypes\*.h  
        .....bit\*.h  
        .....fx\*.h  
        .....int\*.h  
        .....kernel\*.h  
        .....tracing\*.h  
        .....utils\*.h  
....Lib\  
        systemc2.0.1.lib  
....Tutorial\  
        .....risc_cpu\  
        .....counter\
```

2.4 Summary

You have successfully generated the SystemC-Borland library binary. In addition, the header files and library, necessary during compilation of the SystemC design, are set up.

3

USING SYSTEMC LIBRARY WITH BORLAND C++ BUILDER - CONSOLE APPLICATION

In this section, we describe the process of setting up a console application in Borland. For this purpose, the “risc_cpu” SystemC design that is included with the original SystemC examples is used. Next, we will make use of the header file and library generated earlier to compile the design. Issues with this flow are described and possible solutions are recommended.

3.1 Setting Up the Console Application

To illustrate the steps of compiling SystemC design files within the Borland C++ Builder IDE, we will use the “risc_cpu” design in the original SystemC library source files. Copy all the files from `<C:\SystemC\systemc2.0.1-src-original\systemc-2.0.1\examples\systemc\risc_cpu\>` to `<C:\SystemC\Tutorial\risc_cpu\>`.

Next, invoke Borland C++ Builder. Create a new console application by selecting [File | New...]. Select [Console Wizard] (Figure 1) and click [OK]

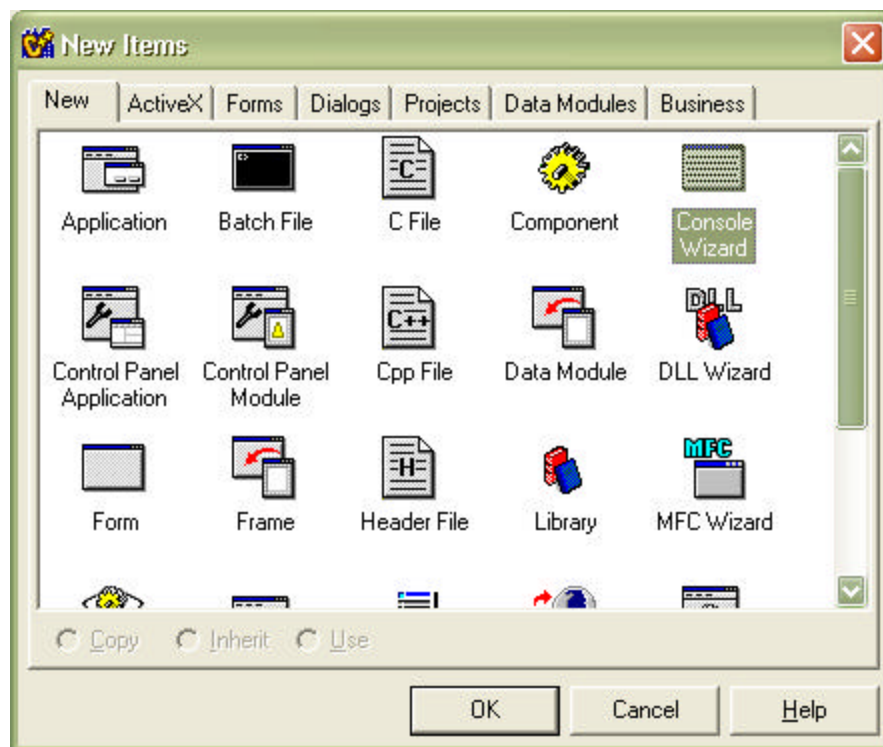


Figure 1: Create a new console application

In the Console Wizard window, complete the form as shown in Figure 2 and click [OK].

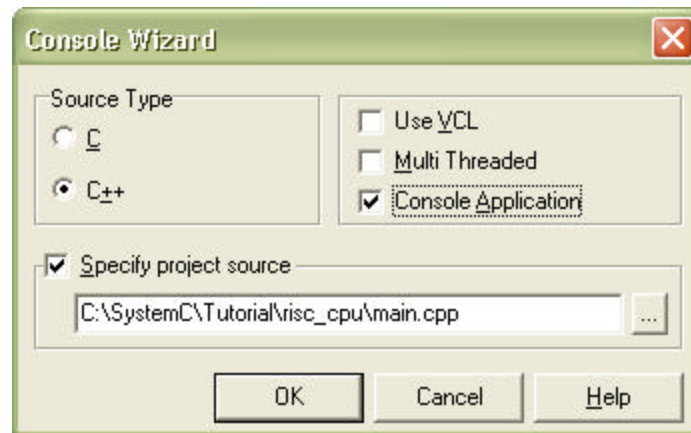


Figure 2: Select the properties of the console application

Save the project using [File | Save Project As...] and type `<risc_cpu.bpr>` as the filename (Figure 3).

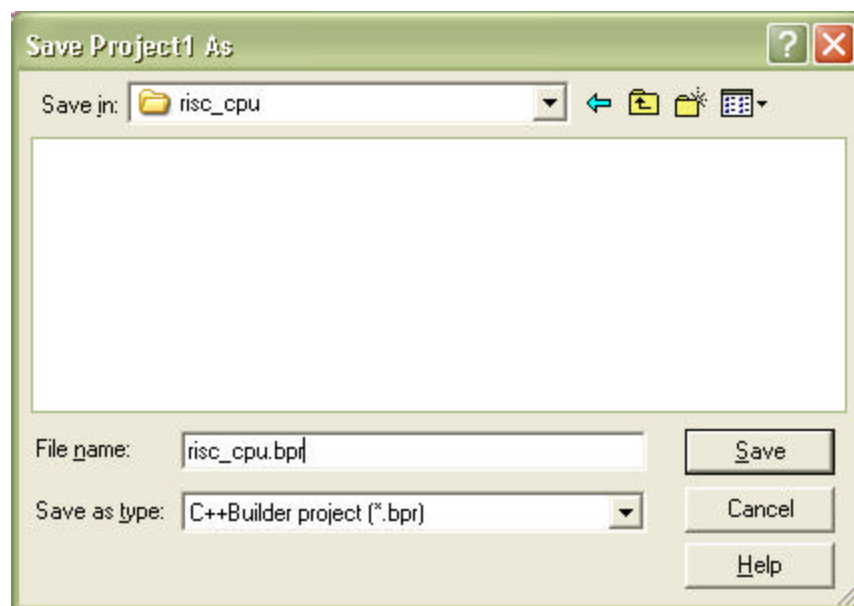


Figure 3: Save the project

Add the rest of the design files into the project by selecting [Project | Add to Project...]. Include all the design files <C:\SystemC\Tutorial\risc_cpu*.cpp> except <main.cpp> into the project as shown in Figure 4.

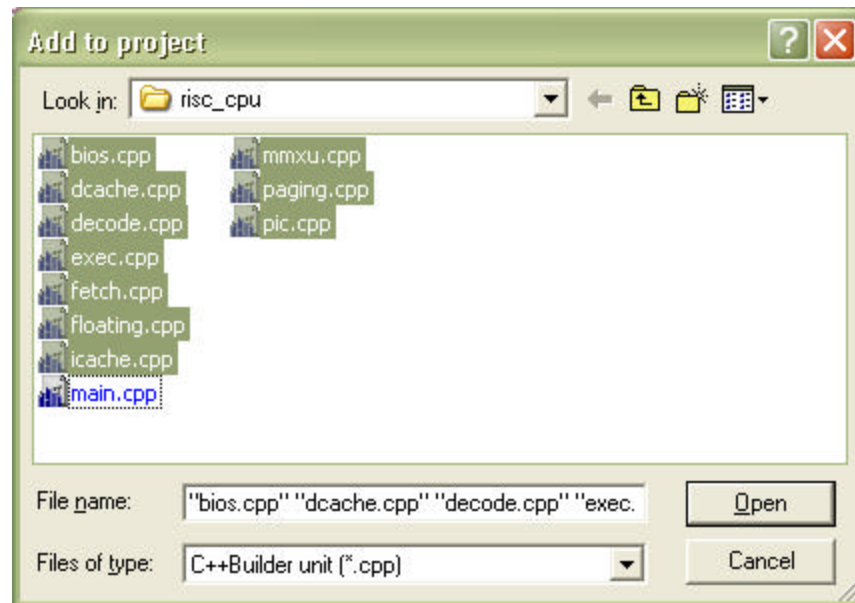


Figure 4: Include the design files into the project

Include the SystemC library binary <C:\SystemC\Lib\systemc2.0.1.lib> into the project (Figure 5).

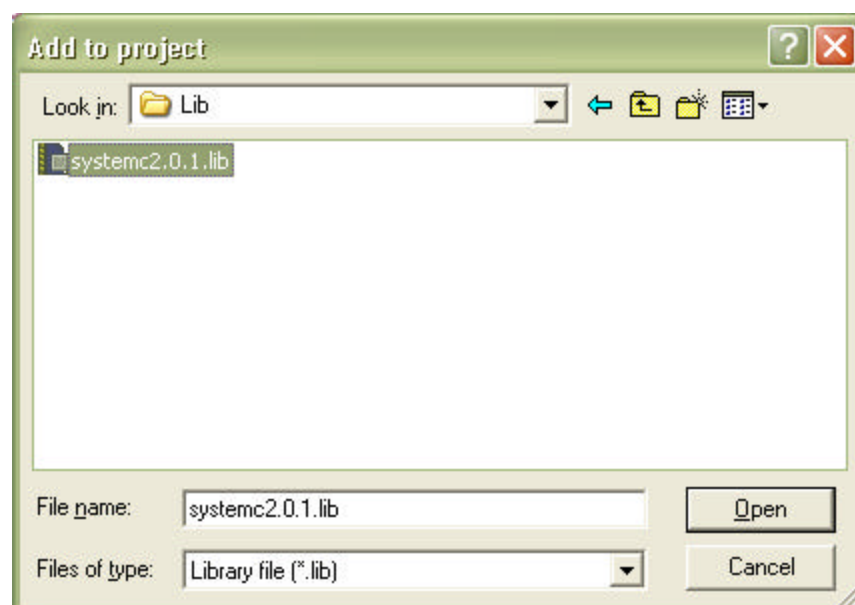


Figure 5: Include the SystemC library into the project

Change the project settings to include the SystemC header files and library binary using [Project | Options...]. Click on the [Directories/Conditionals] tab as shown in Figure 6. Modify [Include path:] to include "C:\SystemC\Include;". Similarly, modify [Library path:] to include "C:\SystemC\Lib;". You must enter the "semi-colons" as stated. Finally, click [OK] to exit the dialog box.

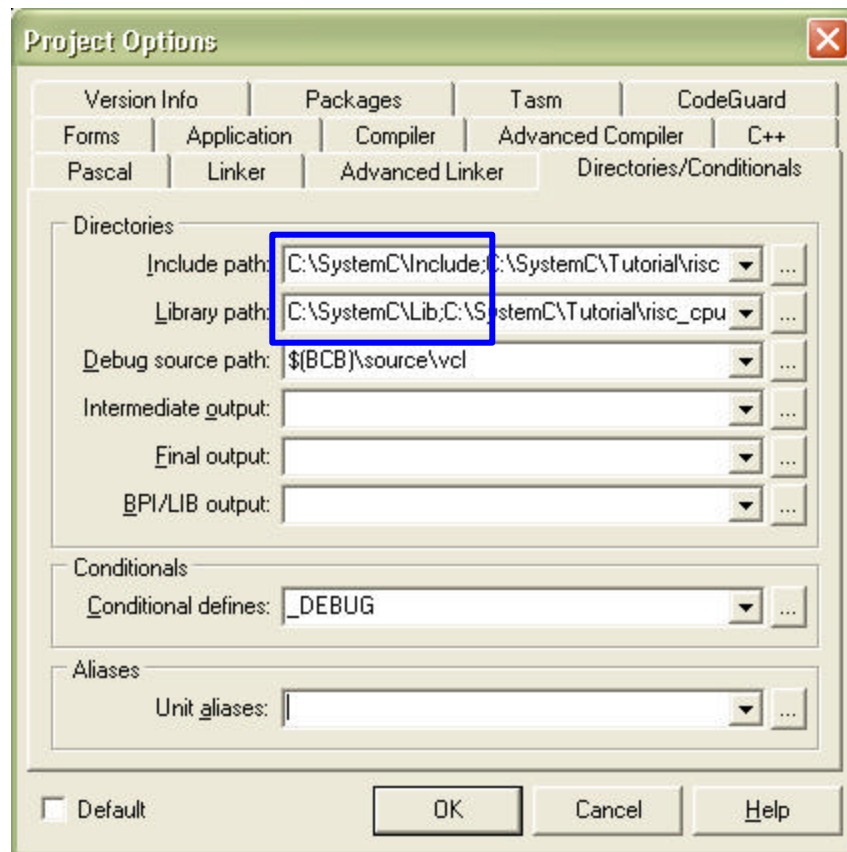


Figure 6: Include the SystemC header and library binary

To allow the IDE to trace the SystemC design during the debugging process, open the [Project | Options...] dialog box again. Next, choose the [Linker] tab and check [Linking | Create debug information] (Figure 7). Next, go to the [Compiler] tab and check [Debugging | Debug information] and [Debugging | Line number Information] (Figure 8)

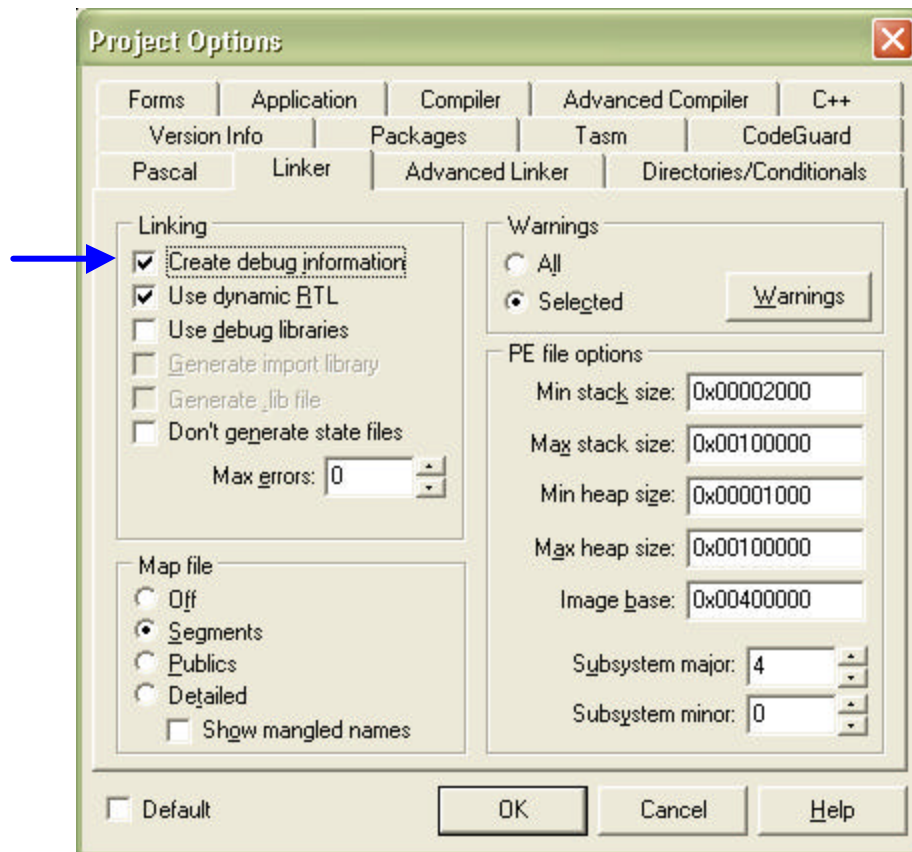


Figure 7: Enable debugging in [Linker] tab

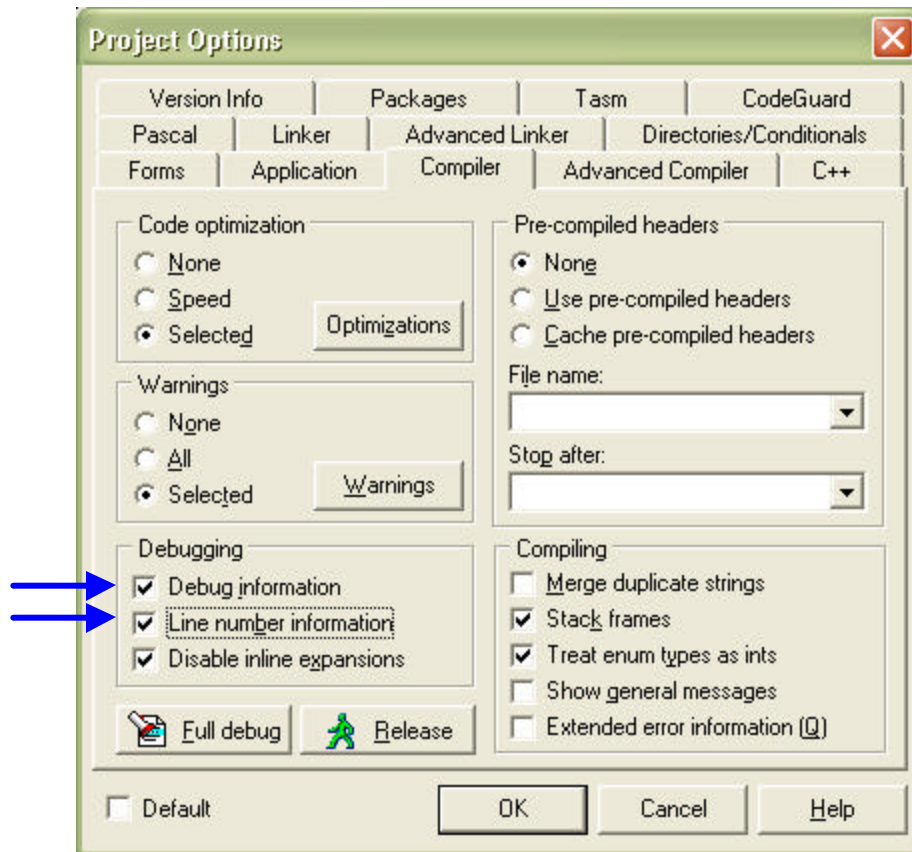


Figure 8: Enable debugging in [Compiler] tab

3.2 Compiling and Running the Console Application

Select [Project | Make risc_cpu] to start the compilation process. There will be some warnings and 26 errors (listed in Appendix A2). The number of warnings may vary depending on which files Borland compiles first.

It is discovered that by commenting out an unnecessary header at line 37 in `<decode.cpp>`. The project will compile with 47 warnings (listed in Appendix A3) only. It is not clear why the statement is required in the first place as there is no reference to "MAX" within the design.

```
37: // #include <climits>      // for definition on value 's MAX
```

Select [Project | Build risc_cpu] to build the executable. This process generates 50 warnings (listed in Appendix A4). The difference in the number of warnings for [Make] and [Build] was due to the fact that [Make] was executed twice.

Execute the project with [Run | Run] and you will see a Windows Command Prompt with fast scrolling text.

To view the result, open a Windows Command Prompt manually. Then, change the directory to `<C:\SystemC\Tutorial\risc_cpu>`. Right-click on the title bar and select [Properties] as shown in Figure 9.

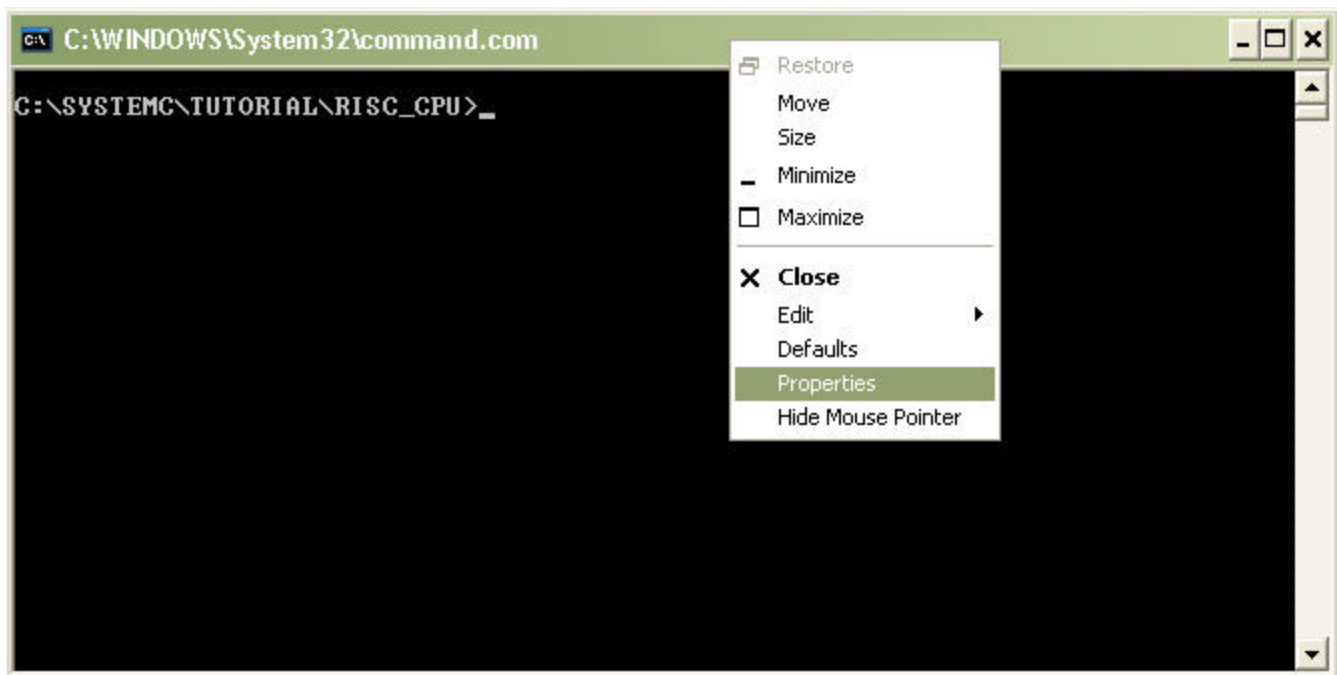


Figure 9: Change the properties of the Windows Command Prompt

At the [Layout] tab, change the value of [Screen Buffer Size] to “2000” and click [OK]. This will allow all the results to be stored within the screen buffer.

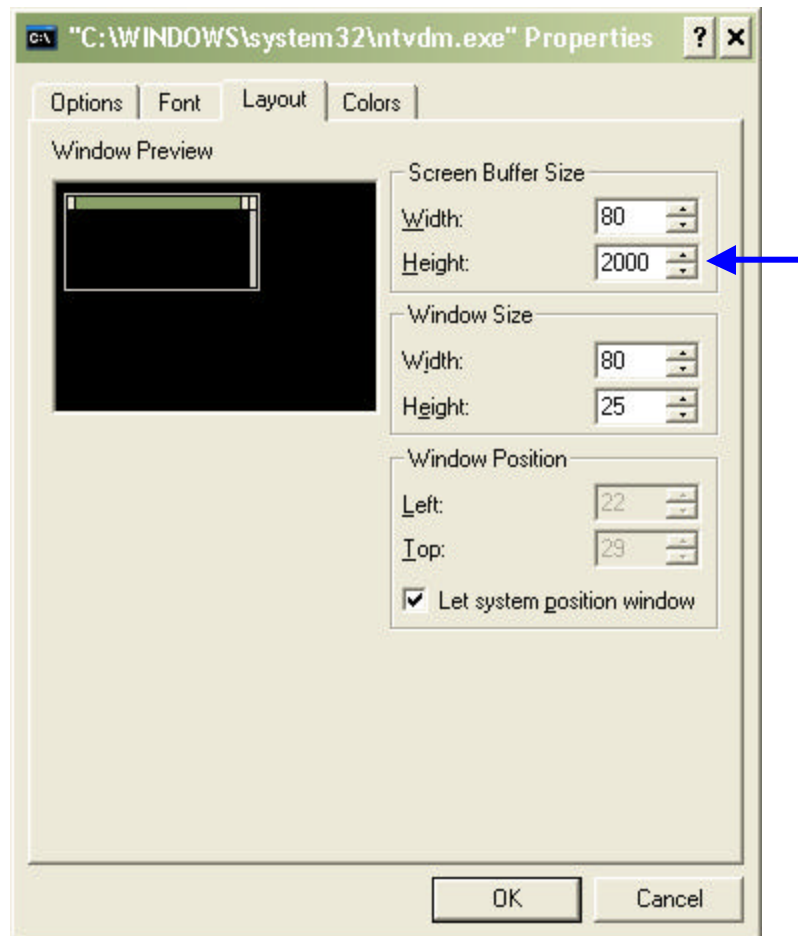


Figure 10: Change the buffer size of the Command Prompt

In the [Apply Properties] dialog box that appears next, select [Apply properties to current window only] and click on [OK].

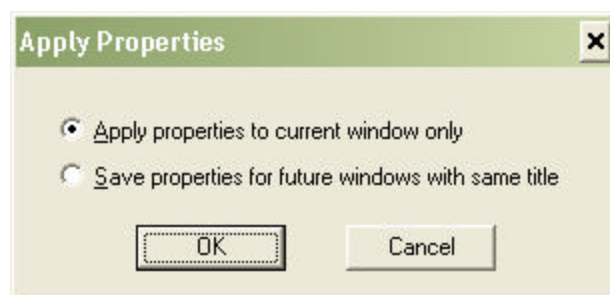


Figure 11: Apply the property change to current window only

Finally, type “risc_cpu.exe” to execute the project. A listing of the program output can be found in Appendix A5.

In this section, the issues, arise from executing the SystemC design in Borland, are discussed.

The flow described earlier was tested on a few PCs running Windows 98 and Windows XP, with differing results. In most cases, the design can be compiled successfully. However, an exception is raised when the design runs. This is shown in Figure 12 and Figure 13. The statement that raised the exception is shown in Figure 14. This is at line 429 of `<sc_simcontext.h>`.

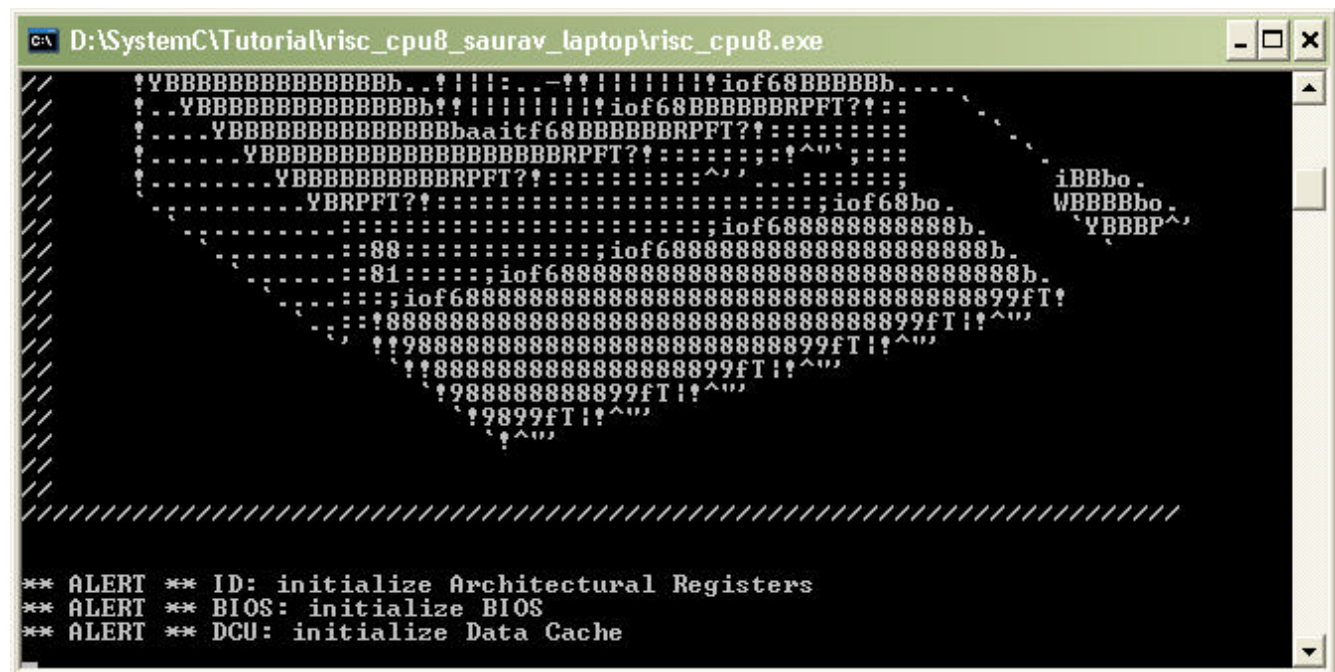


Figure 12: Windows Command Prompt output when exception occurs

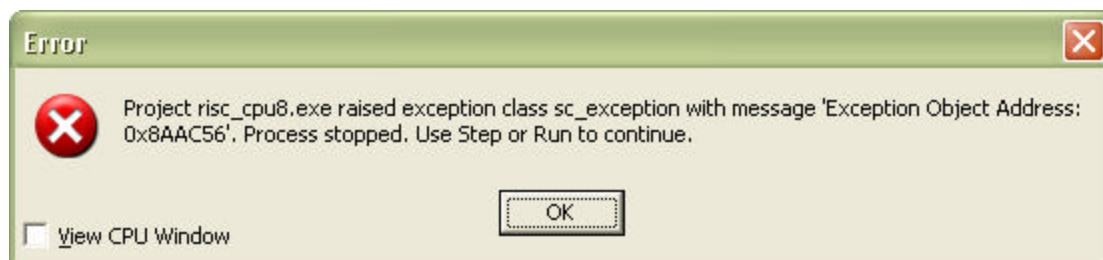


Figure 13: The exception message

```

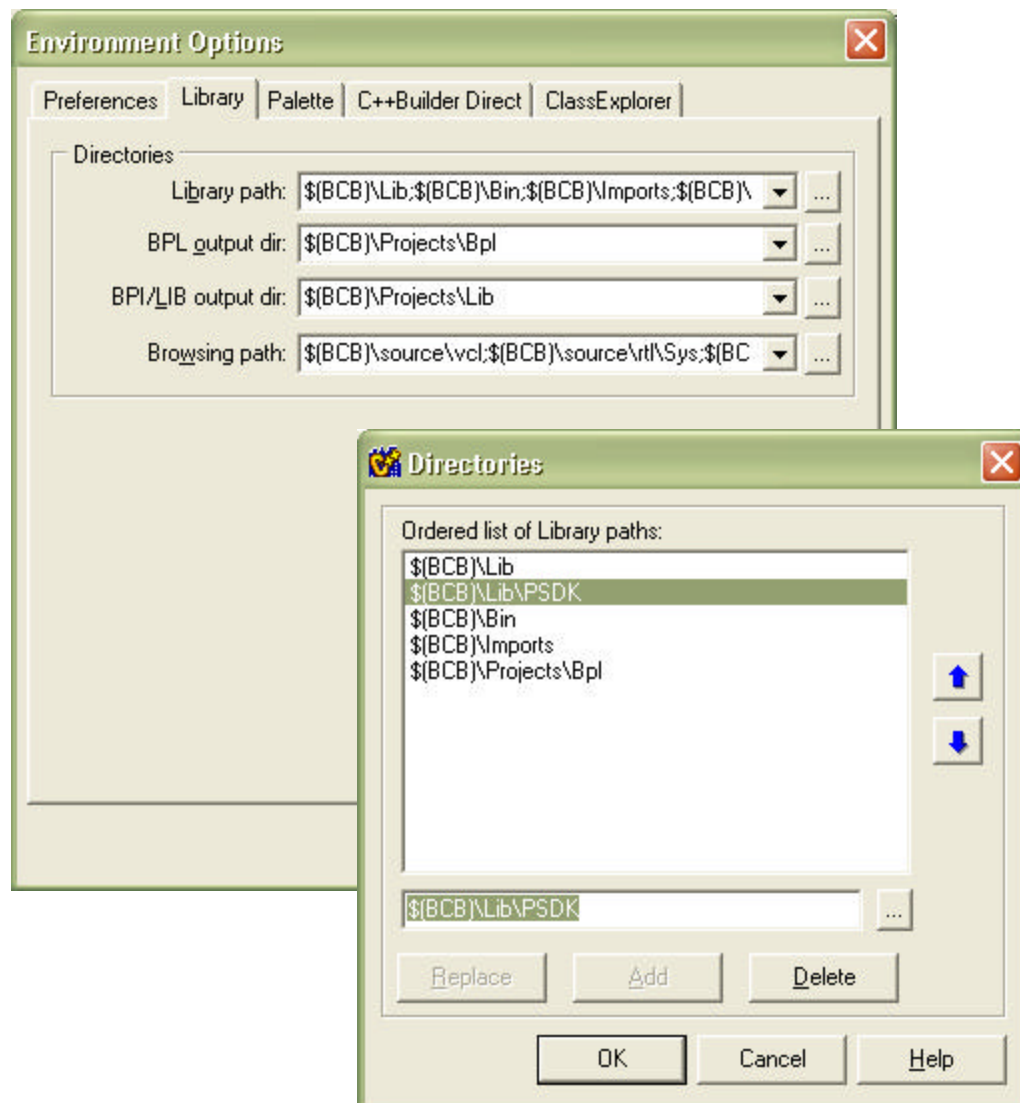
line 422:    // for backward compatibility with 1.0
line 423:    inline
line 424:    void
line 425:    sc_start( double duration = -1 ) // in default time units
line 426:    {
line 427:    if( duration == -1 ) {
line 428:        // simulate forever
line 429:        sc_start( SC_ZERO_TIME );
line 430:    } else {
line 431:        sc_start( sc_time( duration, true ) );
line 432:    }
line 433:    }

```

Figure 14: The statment that raises exception in SystemC library

Possible solutions are recommended but it is not clear why they are needed in some cases. On a particular PC, none of the tricks listed works!

- In Borland, go to [Tools | Environment Options...]. Next, select the [Library] tab and insert “\$(BCB)\Lib\PSDK” as the second entry in [Library path:] by clicking the arrows button on the right.



- Quit from Borland. Open <C:\SystemC\Tutorial\risc_cpu\risc_cpu.bpr> in notepad. Go to the “CFLAGS1” line and remove the “-b-“, “-Vx” and “-Ve” flags and insert the “-b” (without the postfix minus) flag. Then, launch Borland and rebuild the project [Project | Build risc_cpu] before running [Run | Run].
- Go to [Project | Options...], [Packages] tab, and uncheck all the [Design packages]. Click on [YES] for all dialog boxes. Next, uncheck [Runtime packages | Build with runtime packages] and click [OK]. Then, rebuild the project [Project | Build risc_cpu] before running [Run | Run].
- A working copy of my own <risc_cpu.bpr> is listed in Appendix A6. Hopefully this helps.

3.3.2 More designs - fir

More designs from the example directory of the original SystemC source codes are tested with Borland C++ Builder. In the FIR design, the register-transfer level version of the design consisting of <*main_rtl*, *fir_fsm*, *fir_data*, *display*, *stimulus*> compiles and run successfully. However, the behavioural version <*main*, *fir*, *display*, *stimulus*> generates a run-time exception. We observe that a main difference between the two versions is that “SC_CTHREAD” is used in the behavioural version. However, we are unable to conclude that this is the cause of the error.

3.4 Summary

We have demonstrated that it is possible to support SystemC designs with Borland C++ Builder running in the Windows environment. However, many issues still exist. Possible reasons include, but are not limited to:

- Porting of the original SystemC libraries by SystemC_Win to be compatible to Borland Compiler is not entirely correct.
- The compiler and linker flags or the settings in [Project | Options...] are not appropriate.

If you have the solutions to these issues, please email it to quekkh@pmail.ntu.edu so that I can update this document.

A1. MAKE.LOG

MAKE Version 5.2 Copyright (c) 1987, 2000 Borland

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\bit\sc_logic.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

systemc\datatypes\bit\sc_logic.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\communication\sc_communication_ids.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

systemc\communication\sc_communication_ids.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\bit\sc_bit_ids.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

systemc\datatypes\bit\sc_bit_ids.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\fx\sc_fx_ids.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

systemc\datatypes\fx\sc_fx_ids.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\int\sc_int_ids.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

systemc\datatypes\int\sc_int_ids.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\int\sc_length_param.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

systemc\datatypes\int\sc_length_param.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\kernel\sc_kernel_ids.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

systemc\kernel\sc_kernel_ids.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\kernel\sc_cor_fiber.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

systemc\kernel\sc_cor_fiber.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\kernel\sc_cor_qt.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

systemc\kernel\sc_cor_qt.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\utils\sc_utils_ids.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

systemc\utils\sc_utils_ids.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\utils\sc_stop_here.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\utils\sc_stop_here.cpp:

```
"C:\Program Files\Borland\CBuilder5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBuilder5\include -L"C:\Program Files\Borland\CBuilder5\lib -L"C:\Program  
Files\Borland\CBuilder5\lib\PSDK systemc\utils\sc_hash.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\utils\sc_hash.cpp:

```
"C:\Program Files\Borland\CBuilder5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBuilder5\include -L"C:\Program Files\Borland\CBuilder5\lib -L"C:\Program  
Files\Borland\CBuilder5\lib\PSDK systemc\utils\sc_list.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\utils\sc_list.cpp:

```
"C:\Program Files\Borland\CBuilder5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBuilder5\include -L"C:\Program Files\Borland\CBuilder5\lib -L"C:\Program  
Files\Borland\CBuilder5\lib\PSDK systemc\utils\sc_mempool.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\utils\sc_mempool.cpp:

**Warning W8004 systemc\utils\sc_mempool.cpp 126: 'result' is assigned a value that is never used in
function sc_allocator::allocate()**

```
"C:\Program Files\Borland\CBuilder5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBuilder5\include -L"C:\Program Files\Borland\CBuilder5\lib -L"C:\Program  
Files\Borland\CBuilder5\lib\PSDK systemc\utils\sc_pq.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\utils\sc_pq.cpp:

```
"C:\Program Files\Borland\CBuilder5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBuilder5\include -L"C:\Program Files\Borland\CBuilder5\lib -L"C:\Program  
Files\Borland\CBuilder5\lib\PSDK systemc\utils\sc_string.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\utils\sc_string.cpp:

```
"C:\Program Files\Borland\CBuilder5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBuilder5\include -L"C:\Program Files\Borland\CBuilder5\lib -L"C:\Program  
Files\Borland\CBuilder5\lib\PSDK systemc\utils\sc_vector.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\utils\sc_vector.cpp:

```
"C:\Program Files\Borland\CBuilder5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBuilder5\include -L"C:\Program Files\Borland\CBuilder5\lib -L"C:\Program  
Files\Borland\CBuilder5\lib\PSDK systemc\utils\sc_exception.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\utils\sc_exception.cpp:

```
"C:\Program Files\Borland\CBuilder5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBuilder5\include -L"C:\Program Files\Borland\CBuilder5\lib -L"C:\Program  
Files\Borland\CBuilder5\lib\PSDK systemc\kernel\sc_lambda.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\kernel\sc_lambda.cpp:

```
"C:\Program Files\Borland\CBuilder5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBuilder5\include -L"C:\Program Files\Borland\CBuilder5\lib -L"C:\Program  
Files\Borland\CBuilder5\lib\PSDK systemc\kernel\sc_main.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\kernel\sc_main.cpp:

```
"C:\Program Files\Borland\CBuilder5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBuilder5\include -L"C:\Program Files\Borland\CBuilder5\lib -L"C:\Program  
Files\Borland\CBuilder5\lib\PSDK systemc\kernel\sc_module.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\kernel\sc_module.cpp:

```
"C:\Program Files\Borland\CBuilder5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBuilder5\include -L"C:\Program Files\Borland\CBuilder5\lib -L"C:\Program  
Files\Borland\CBuilder5\lib\PSDK systemc\kernel\sc_module_name.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\kernel\sc_module_name.cpp:

```
"C:\Program Files\Borland\CBuilder5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBuilder5\include -L"C:\Program Files\Borland\CBuilder5\lib -L"C:\Program  
Files\Borland\CBuilder5\lib\PSDK systemc\kernel\sc_object.cpp
```


Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\kernel\sc_module_registry.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\kernel\sc_name_gen.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\kernel\sc_name_gen.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\int\sc_int_base.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\int\sc_int_base.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\int\sc_int32_mask.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\int\sc_int32_mask.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\int\sc_int64_io.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\int\sc_int64_io.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\int\sc_int64_mask.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\int\sc_int64_mask.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\int\sc_nbdefs.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\int\sc_nbdefs.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\int\sc_nbexterns.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\int\sc_nbexterns.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\int\sc_nbutils.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\int\sc_nbutils.cpp:

**Warning W8060 systemc\datatypes\int\sc_nbutils.cpp 209: Possibly incorrect assignment in function
vec_from_str(int,int,unsigned long *,const char *,sc_numrep)**

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\int\sc_signed.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\int\sc_signed.cpp:

**Warning W8041 systemc\datatypes/int/sc_nbutils.h 559: Negating unsigned value in function
get_sign<unsigned long>(unsigned long &)**

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\int\sc_uint_base.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\int\sc_uint_base.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\int\sc_unsigned.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\int\sc_unsigned.cpp:

**Warning W8041 systemc\datatypes\int\sc_nbutils.h 559: Negating unsigned value in function
get_sign<unsigned long>(unsigned long &)**

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\fx\sc_fxcast_switch.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\fx\sc_fxcast_switch.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\fx\sc_fxdefs.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\fx\sc_fxdefs.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\fx\sc_fxnum.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\fx\sc_fxnum.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\fx\sc_fxnum_observer.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\fx\sc_fxnum_observer.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\fx\sc_fxtype_params.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\fx\sc_fxtype_params.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\fx\sc_fxval.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\fx\sc_fxval.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\fx\sc_fxval_observer.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\fx\sc_fxval_observer.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\utils\sc_report.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\utils\sc_report.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\utils\sc_report_handler.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\utils\sc_report_handler.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\fx\scfx_mant.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\fx\scfx_mant.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\fx\scfx_pow10.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\fx\scfx_pow10.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\fx\scfx_rep.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\fx\scfx_rep.cpp:

Warning W8008 systemc\datatypes\fx\scfx_rep.cpp 557: Condition is always true in function
scfx_rep::from_string(const char *,int)

Warning W8008 systemc\datatypes\fx\scfx_rep.cpp 595: Condition is always true in function
scfx_rep::from_string(const char *,int)

Warning W8008 systemc\datatypes\fx\scfx_rep.cpp 621: Condition is always true in function
scfx_rep::from_string(const char *,int)

Warning W8008 systemc\datatypes\fx\scfx_rep.cpp 681: Condition is always true in function
scfx_rep::from_string(const char *,int)

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -twm -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\fx\scfx_utils.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\fx\scfx_utils.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -twm -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\bit\sc_bit.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\bit\sc_bit.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -twm -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\bit\sc_bv_base.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\bit\sc_bv_base.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -twm -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\datatypes\bit\sc_lv_base.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\datatypes\bit\sc_lv_base.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -twm -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\communication\sc_clock.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\communication\sc_clock.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -twm -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\communication\sc_port.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\communication\sc_port.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -twm -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\communication\sc_interface.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\communication\sc_interface.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -twm -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\communication\sc_mutex.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\communication\sc_mutex.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -twm -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\communication\sc_prim_channel.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\communication\sc_prim_channel.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -twm -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\communication\sc_semaphore.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\communication\sc_semaphore.cpp:

"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -twm -DWIN32;NO_STRICT;RTL DLL -vi -
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program
Files\Borland\CBUILDER5\lib\PSDK systemc\communication\sc_signal_resolved.cpp

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\communication\sc_signal_resolved.cpp:

```
"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program  
Files\Borland\CBUILDER5\lib\PSDK systemc\communication\sc_signal.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\communication\sc_signal.cpp:

```
"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program  
Files\Borland\CBUILDER5\lib\PSDK systemc\communication\sc_event_finder.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\communication\sc_event_finder.cpp:

```
"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program  
Files\Borland\CBUILDER5\lib\PSDK systemc\communication\sc_signal_ports.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\communication\sc_signal_ports.cpp:

```
"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program  
Files\Borland\CBUILDER5\lib\PSDK systemc\communication\sc_signal_resolved_ports.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\communication\sc_signal_resolved_ports.cpp:

```
"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program  
Files\Borland\CBUILDER5\lib\PSDK systemc\tracing\sc_isdb_trace.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\tracing\sc_isdb_trace.cpp:

```
"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program  
Files\Borland\CBUILDER5\lib\PSDK systemc\tracing\sc_trace.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\tracing\sc_trace.cpp:

```
"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program  
Files\Borland\CBUILDER5\lib\PSDK systemc\tracing\sc_vcd_trace.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\tracing\sc_vcd_trace.cpp:

```
"C:\Program Files\Borland\CBUILDER5\bin\bcc32.exe -c -tw -tWM -DWIN32;NO_STRICT;RTL DLL -vi -  
I"C:\Program Files\Borland\CBUILDER5\include -L"C:\Program Files\Borland\CBUILDER5\lib -L"C:\Program  
Files\Borland\CBUILDER5\lib\PSDK systemc\tracing\sc_wif_trace.cpp
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
systemc\tracing\sc_wif_trace.cpp:

```
"C:\Program Files\Borland\CBUILDER5\bin\tlib.exe systemc2.0.1.lib /P256 +sc_logic.obj  
+sc_communication_ids.obj +sc_bit_ids.obj +sc_fx_ids.obj +sc_int_ids.obj +sc_length_param.obj  
+sc_kernel_ids.obj +sc_cor_fiber.obj +sc_cor_qt.obj +sc_utils_ids.obj +sc_stop_here.obj  
+sc_hash.obj +sc_list.obj +sc_mempool.obj +sc_pq.obj +sc_string.obj +sc_vector.obj +sc_exception.obj  
+sc_lambda.obj +sc_main.obj +sc_module.obj +sc_module_name.obj +sc_object.obj +sc_object_manager.obj  
+sc_sensitive.obj +sc_simcontext.obj +sc_ver.obj +sc_wait.obj +sc_time.obj +sc_process_int.obj  
+sc_attribute.obj +sc_event.obj +sc_runnable.obj +sc_wait_ctype.obj +sc_module_registry.obj  
+sc_name_gen.obj +sc_int_base.obj +sc_int32_mask.obj +sc_int64_io.obj +sc_int64_mask.obj  
+sc_nbdefs.obj +sc_nbexterns.obj +sc_nbutils.obj +sc_signed.obj +sc_uint_base.obj +sc_unsigned.obj  
+sc_fxcast_switch.obj +sc_fxdefs.obj +sc_fxnum.obj +sc_fxnum_observer.obj +sc_fxtype_params.obj  
+sc_fxval.obj +sc_fxval_observer.obj +sc_fx_mant.obj +sc_fx_pow10.obj +sc_fx_rep.obj +sc_fx_utils.obj  
+sc_report.obj +sc_report_handler.obj +sc_bit.obj +sc_bv_base.obj +sc_lv_base.obj +sc_clock.obj  
+sc_port.obj +sc_interface.obj +sc_mutex.obj +sc_prim_channel.obj +sc_semaphore.obj  
+sc_signal_resolved.obj +sc_signal.obj +sc_event_finder.obj +sc_signal_ports.obj  
+sc_signal_resolved_ports.obj +sc_isdb_trace.obj +sc_trace.obj +sc_vcd_trace.obj +sc_wif_trace.obj
```

TLIB 4.5 Copyright (c) 1987, 1999 Inprise Corporation

Warning: public 'sc_dt::sc_logic_0' in module 'sc_logic' clashes with prior module 'sc_logic'

Warning: public 'sc_dt::sc_logic_1' in module 'sc_logic' clashes with prior module 'sc_logic'

Warning: public 'sc_dt::sc_logic_Z' in module 'sc_logic' clashes with prior module 'sc_logic'

Warning: public 'sc_dt::sc_logic_X' in module 'sc_logic' clashes with prior module 'sc_logic'

A2. MAKE RISC_CPU (WITH ERRORS)

```
[C++ Error] wincrypt.h(2034): E2147 'size_t' cannot start a parameter declaration
[C++ Error] wincrypt.h(5852): E2147 'size_t' cannot start a parameter declaration
[C++ Warning] rpcndr.h(217): W8054 Style of function definition is now obsolete
[C++ Error] rpcndr.h(217): E2275 { expected
[C++ Error] rpcndr.h(457): E2141 Declaration syntax error
[C++ Error] rpcndr.h(676): E2189 extern variable cannot be initialized
[C++ Error] rpcndr.h(677): E2034 Cannot convert 'int' to 'void *'
[C++ Error] rpcndr.h(677): E2293 ) expected
[C++ Error] rpcndr.h(901): E2303 Type name expected
[C++ Error] rpcndr.h(1119): E2303 Type name expected
[C++ Error] rpcndr.h(1138): E2303 Type name expected
[C++ Error] rpcndr.h(2826): E2257 , expected
[C++ Error] rpcndr.h(2842): E2189 extern variable cannot be initialized
[C++ Error] rpcndr.h(2843): E2034 Cannot convert 'int' to 'void *'
[C++ Error] rpcndr.h(2843): E2293 ) expected
[C++ Error] rpcndr.h(2906): E2189 extern variable cannot be initialized
[C++ Error] rpcndr.h(2907): E2034 Cannot convert 'int' to 'void *'
[C++ Error] rpcndr.h(2907): E2293 ) expected
[C++ Error] rpcndr.h(3003): E2189 extern variable cannot be initialized
[C++ Error] rpcndr.h(3004): E2034 Cannot convert 'int' to 'void *'
[C++ Error] rpcndr.h(3004): E2293 ) expected
[C++ Error] rpcndr.h(3017): E2189 extern variable cannot be initialized
[C++ Error] rpcndr.h(3018): E2034 Cannot convert 'int' to 'void *'
[C++ Error] rpcndr.h(3018): E2293 ) expected
[C++ Error] rpcndr.h(3091): E2189 extern variable cannot be initialized
[C++ Error] rpcndr.h(3092): E2108 Improper use of typedef 'PMIDL_STUB_MESSAGE'
[C++ Error] rpcndr.h(3092): E2228 Too many error or warning messages
```

A3. MAKE RISC_CPU (SUCCESS)

```
[C++ Warning] decode.cpp(788): W8004 'lastreg_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(59): W8004 'branch_direction_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(57): W8004 'srcC_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(52): W8004 'label_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(50): W8004 'imm_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(48): W8004 'regB_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(47): W8004 'regA_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(46): W8004 'opcode_tmp' is assigned a value that is never used
[C++ Warning] exec.cpp(47): W8004 'dinp_tmp' is assigned a value that is never used
[C++ Warning] exec.cpp(46): W8004 'dina_tmp' is assigned a value that is never used
[C++ Warning] exec.cpp(44): W8004 'opcode_tmp' is assigned a value that is never used
[C++ Warning] fetch.cpp(191): W8004 'datao_tmp' is assigned a value that is never used
[C++ Warning] floating.cpp(95): W8008 Condition is always true
[C++ Warning] floating.cpp(116): W8008 Condition is always true
[C++ Warning] floating.cpp(183): W8004 'exponent_tmp' is assigned a value that is never used
[C++ Warning] floating.cpp(63): W8004 'result_sign_tmp' is assigned a value that is never used
[C++ Warning] floating.cpp(62): W8004 'result_exp_tmp' is assigned a value that is never used
[C++ Warning] floating.cpp(61): W8004 'overflow_sign_tmp' is assigned a value that is never used
[C++ Warning] floating.cpp(58): W8004 'exponent_diff_tmp' is assigned a value that is never used
[C++ Warning] floating.cpp(43): W8004 'opcode_tmp' is assigned a value that is never used
[C++ Warning] icache.cpp(69): W8008 Condition is always true
[C++ Warning] icache.cpp(77): W8008 Condition is always false
[C++ Warning] icache.cpp(86): W8008 Condition is always false
[C++ Warning] icache.cpp(87): W8066 Unreachable code
[C++ Warning] icache.cpp(89): W8008 Condition is always true
[C++ Warning] mmxu.cpp(70): W8004 'mmxcl_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(69): W8004 'mmxcu_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(68): W8004 'mmxc3_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(67): W8004 'mmxc2_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(66): W8004 'mmxc1_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(65): W8004 'mmxc0_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(64): W8004 'mmxb3_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(63): W8004 'mmxb2_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(62): W8004 'mmxb1_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(61): W8004 'mmxb0_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(60): W8004 'mma3_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(59): W8004 'mma2_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(58): W8004 'mma1_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(57): W8004 'mma0_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(54): W8004 'mmxb_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(53): W8004 'mma_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(48): W8004 'opcode_tmp' is assigned a value that is never used
[C++ Warning] paging.cpp(71): W8008 Condition is always false
[C++ Warning] paging.cpp(72): W8066 Unreachable code
[C++ Warning] paging.cpp(88): W8004 'address_conversion_factor' is assigned a value that is never used
[C++ Warning] paging.cpp(69): W8004 'dataout_tmp' is assigned a value that is never used
[C++ Warning] paging.cpp(43): W8004 'address' is assigned a value that is never used
```

A4. BUILD RISC_CPU (SUCCESS)

```
[C++ Warning] bios.cpp(59): W8008 Condition is always false
[C++ Warning] bios.cpp(60): W8066 Unreachable code
[C++ Warning] dcache.cpp(92): W8004 'reg_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(788): W8004 'lastreg_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(59): W8004 'branch_direction_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(57): W8004 'srcC_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(52): W8004 'label_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(50): W8004 'imm_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(48): W8004 'regB_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(47): W8004 'regA_tmp' is assigned a value that is never used
[C++ Warning] decode.cpp(46): W8004 'opcode_tmp' is assigned a value that is never used
[C++ Warning] exec.cpp(47): W8004 'dinb_tmp' is assigned a value that is never used
[C++ Warning] exec.cpp(46): W8004 'dina_tmp' is assigned a value that is never used
[C++ Warning] exec.cpp(44): W8004 'opcode_tmp' is assigned a value that is never used
[C++ Warning] fetch.cpp(191): W8004 'datao_tmp' is assigned a value that is never used
[C++ Warning] floating.cpp(95): W8008 Condition is always true
[C++ Warning] floating.cpp(116): W8008 Condition is always true
[C++ Warning] floating.cpp(183): W8004 'exponent_tmp' is assigned a value that is never used
[C++ Warning] floating.cpp(63): W8004 'result_sign_tmp' is assigned a value that is never used
[C++ Warning] floating.cpp(62): W8004 'result_exp_tmp' is assigned a value that is never used
[C++ Warning] floating.cpp(61): W8004 'overflow_sign_tmp' is assigned a value that is never used
[C++ Warning] floating.cpp(58): W8004 'exponent_diff_tmp' is assigned a value that is never used
[C++ Warning] floating.cpp(43): W8004 'opcode_tmp' is assigned a value that is never used
[C++ Warning] icache.cpp(69): W8008 Condition is always true
[C++ Warning] icache.cpp(77): W8008 Condition is always false
[C++ Warning] icache.cpp(86): W8008 Condition is always false
[C++ Warning] icache.cpp(87): W8066 Unreachable code
[C++ Warning] icache.cpp(89): W8008 Condition is always true
[C++ Warning] mmxu.cpp(70): W8004 'mmxcL_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(69): W8004 'mmxcU_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(68): W8004 'mmxc3_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(67): W8004 'mmxc2_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(66): W8004 'mmxc1_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(65): W8004 'mmxc0_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(64): W8004 'mmxb3_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(63): W8004 'mmxb2_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(62): W8004 'mmxb1_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(61): W8004 'mmxb0_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(60): W8004 'mmxa3_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(59): W8004 'mmxa2_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(58): W8004 'mmxa1_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(57): W8004 'mmxa0_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(54): W8004 'mmxb_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(53): W8004 'mmxa_tmp' is assigned a value that is never used
[C++ Warning] mmxu.cpp(48): W8004 'opcode_tmp' is assigned a value that is never used
[C++ Warning] paging.cpp(71): W8008 Condition is always false
[C++ Warning] paging.cpp(72): W8066 Unreachable code
[C++ Warning] paging.cpp(88): W8004 'address_conversion_factor' is assigned a value that is never used
[C++ Warning] paging.cpp(69): W8004 'dataout_tmp' is assigned a value that is never used
[C++ Warning] paging.cpp(43): W8004 'address' is assigned a value that is never used
```

A5. RESULT OF RISC_CPU.EXE

[illegible]

** ALERT ** ID: initialize Architectural Registers
** ALERT ** BIOS: initialize BIOS
** ALERT ** DCU: initialize Data Cache

IFU : mem=0xf000001
IFU : pc= 1 at CSIM 5 ns

ID: R0=R0(=0)
: at CSIM 7 ns

ALU : op= 3 A= 0 B= 0
ALU : R= 0-> R0 at CSIM 9 ns

ID: R0=0x0(0) fr ALU at CSIM 10 ns

IFU : mem=0xf000002
IFU : pc= 2 at CSIM 12 ns

ID: R0=R0(=0)
: at CSIM 14 ns

ALU : op= 3 A= 0 B= 0
ALU : R= 0-> R0 at CSIM 16 ns

ID: R0=0x0(0) fr ALU at CSIM 17 ns

IFU : mem=0xf000003
IFU : pc= 3 at CSIM 19 ns

ID: R0=R0(=0)
: at CSIM 21 ns

ALU : op= 3 A= 0 B= 0
ALU : R= 0-> R0 at CSIM 23 ns

ID: R0=0x0(0) fr ALU at CSIM 24 ns

IFU : mem=0xf000004
IFU : pc= 4 at CSIM 26 ns

ID: R0=R0(=0)
: at CSIM 28 ns

ALU : op= 3 A= 0 B= 0
ALU : R= 0-> R0 at CSIM 30 ns

ICU ALERT: *****
: *****AFTER RESET*****
ICU ALERT: *****

ID: R0=0x0(0) fr ALU at CSIM 31 ns

IFU : mem=0xf160000a
IFU : pc= 5 at CSIM 33 ns

ID: R6=10 at CSIM 35 ns

ALU : op= 3 A= 10 B= 0
ALU : R= 10-> R6 at CSIM 37 ns

ID: R6=0xa(10) fr ALU at CSIM 38 ns

IFU : mem=0x0
IFU : pc= 6 at CSIM 40 ns

ID: REGISTERS DUMP at CSIM 42 ns

REG :=====

R 0(00000000)	R 1(00000001)	R 2(fff000e2)	R 3(ffffffff)
R 4(00000004)	R 5(00000005)	R 6(0000000a)	R 7(fcf0fdef)
R 8(00000008)	R 9(00000009)	R10(00000010)	R11(0000ff31)
R12(0000ff12)	R13(00000013)	R14(00000014)	R15(00000015)
R16(00000016)	R17(00fe0117)	R18(00fe0118)	R19(00fe0119)
R20(00fe0220)	R21(00fe0321)	R22(00fe0322)	R23(00ff0423)
R24(00ff0524)	R25(00ff0625)	R26(00ff0726)	R27(00ff0727)
R28(00f70728)	R29(00000029)	R30(00000030)	R31(00000031)

=====

IFU : mem=0xf160000a
IFU : pc= 7 at CSIM 47 ns

ID: R6=10 at CSIM 49 ns

ALU : op= 3 A= 10 B= 0
ALU : R= 10-> R6 at CSIM 51 ns

ID: R6=0xa(10) fr ALU at CSIM 52 ns

IFU : mem=0x0
IFU : pc= 8 at CSIM 54 ns

ID: REGISTERS DUMP at CSIM 56 ns

REG :=====

R 0(00000000)	R 1(00000001)	R 2(fff000e2)	R 3(ffffffff)
R 4(00000004)	R 5(00000005)	R 6(0000000a)	R 7(fcf0fdef)
R 8(00000008)	R 9(00000009)	R10(00000010)	R11(0000ff31)
R12(0000ff12)	R13(00000013)	R14(00000014)	R15(00000015)
R16(00000016)	R17(00fe0117)	R18(00fe0118)	R19(00fe0119)
R20(00fe0220)	R21(00fe0321)	R22(00fe0322)	R23(00ff0423)
R24(00ff0524)	R25(00ff0625)	R26(00ff0726)	R27(00ff0727)
R28(00f70728)	R29(00000029)	R30(00000030)	R31(00000031)

=====

IFU : mem=0xf160000a
IFU : pc= 9 at CSIM 61 ns

ID: R6=10 at CSIM 63 ns

ALU : op= 3 A= 10 B= 0
ALU : R= 10-> R6 at CSIM 65 ns

ID: R6=0xa(10) fr ALU at CSIM 66 ns

IFU : mem=0x0
IFU : pc= a at CSIM 68 ns

ID: REGISTERS DUMP at CSIM 70 ns

REG :=====

R 0(00000000)	R 1(00000001)	R 2(fff000e2)	R 3(ffffffff)
R 4(00000004)	R 5(00000005)	R 6(0000000a)	R 7(fcf0fdef)
R 8(00000008)	R 9(00000009)	R10(00000010)	R11(0000ff31)
R12(0000ff12)	R13(00000013)	R14(00000014)	R15(00000015)
R16(00000016)	R17(00fe0117)	R18(00fe0118)	R19(00fe0119)
R20(00fe0220)	R21(00fe0321)	R22(00fe0322)	R23(00ff0423)
R24(00ff0524)	R25(00ff0625)	R26(00ff0726)	R27(00ff0727)
R28(00f70728)	R29(00000029)	R30(00000030)	R31(00000031)

=====

IFU : mem=0xf160000a
IFU : pc= b at CSIM 75 ns

ID: R6=10 at CSIM 77 ns

ALU : op= 3 A= 10 B= 0
ALU : R= 10-> R6 at CSIM 79 ns

ID: R6=0xa(10) fr ALU at CSIM 80 ns

IFU : mem=0x0
IFU : pc= c at CSIM 82 ns

ID: REGISTERS DUMP at CSIM 84 ns

REG :=====

R 0(00000000)	R 1(00000001)	R 2(fff000e2)	R 3(ffffffff)
R 4(00000004)	R 5(00000005)	R 6(0000000a)	R 7(fcf0fdef)
R 8(00000008)	R 9(00000009)	R10(00000010)	R11(0000ff31)
R12(0000ff12)	R13(00000013)	R14(00000014)	R15(00000015)
R16(00000016)	R17(00fe0117)	R18(00fe0118)	R19(00fe0119)
R20(00fe0220)	R21(00fe0321)	R22(00fe0322)	R23(00ff0423)
R24(00ff0524)	R25(00ff0625)	R26(00ff0726)	R27(00ff0727)
R28(00f70728)	R29(00000029)	R30(00000030)	R31(00000031)

=====

IFU : mem=0xf160000a
IFU : pc= d at CSIM 89 ns

ID: R6=10 at CSIM 91 ns

ALU : op= 3 A= 10 B= 0
ALU : R= 10-> R6 at CSIM 93 ns

ID: R6=0xa(10) fr ALU at CSIM 94 ns

IFU : mem=0x0
IFU : pc= e at CSIM 96 ns

ID: REGISTERS DUMP at CSIM 98 ns

REG :=====

R 0(00000000)	R 1(00000001)	R 2(fff000e2)	R 3(ffffffff)
R 4(00000004)	R 5(00000005)	R 6(0000000a)	R 7(fcf0fdef)
R 8(00000008)	R 9(00000009)	R10(00000010)	R11(0000ff31)
R12(0000ff12)	R13(00000013)	R14(00000014)	R15(00000015)
R16(00000016)	R17(00fe0117)	R18(00fe0118)	R19(00fe0119)
R20(00fe0220)	R21(00fe0321)	R22(00fe0322)	R23(00ff0423)
R24(00ff0524)	R25(00ff0625)	R26(00ff0726)	R27(00ff0727)
R28(00f70728)	R29(00000029)	R30(00000030)	R31(00000031)

=====

IFU : mem=0xf160000a
IFU : pc= f at CSIM 103 ns

ID: R6=10 at CSIM 105 ns

ALU : op= 3 A= 10 B= 0
ALU : R= 10-> R6 at CSIM 107 ns

ID: R6=0xa(10) fr ALU at CSIM 108 ns

IFU : mem=0x0
IFU : pc= 10 at CSIM 110 ns

ID: REGISTERS DUMP at CSIM 112 ns

```
REG :=====
R 0(00000000)  R 1(00000001)  R 2(fff000e2)  R 3(ffffffff)
R 4(00000004)  R 5(00000005)  R 6(0000000a)  R 7(fcf0fdef)
R 8(00000008)  R 9(00000009)  R10(00000010)  R11(0000ff31)
R12(0000ff12)  R13(00000013)  R14(00000014)  R15(00000015)
R16(00000016)  R17(00fe0117)  R18(00fe0118)  R19(00fe0119)
R20(00fe0220)  R21(00fe0321)  R22(00fe0322)  R23(00ff0423)
R24(00ff0524)  R25(00ff0625)  R26(00ff0726)  R27(00ff0727)
R28(00f70728)  R29(00000029)  R30(00000030)  R31(00000031)
=====
```

IFU : mem=0xf1500005

IFU : pc= 11 at CSIM 117 ns

ID: R5=5 at CSIM 119 ns

ALU : op= 3 A= 5 B= 0

ALU : R= 5-> R5 at CSIM 121 ns

ID: R5=0x5(5) fr ALU at CSIM 122 ns

IFU : mem=0x0

IFU : pc= 12 at CSIM 124 ns

ID: REGISTERS DUMP at CSIM 126 ns

```
REG :=====
R 0(00000000)  R 1(00000001)  R 2(fff000e2)  R 3(ffffffff)
R 4(00000004)  R 5(00000005)  R 6(0000000a)  R 7(fcf0fdef)
R 8(00000008)  R 9(00000009)  R10(00000010)  R11(0000ff31)
R12(0000ff12)  R13(00000013)  R14(00000014)  R15(00000015)
R16(00000016)  R17(00fe0117)  R18(00fe0118)  R19(00fe0119)
R20(00fe0220)  R21(00fe0321)  R22(00fe0322)  R23(00ff0423)
R24(00ff0524)  R25(00ff0625)  R26(00ff0726)  R27(00ff0727)
R28(00f70728)  R29(00000029)  R30(00000030)  R31(00000031)
=====
```

IFU : mem=0xf550000

IFU : pc= 13 at CSIM 131 ns

ID: R5=R5(=5)
: at CSIM 133 ns

ALU : op= 3 A= 5 B= 0

ALU : R= 5-> R5 at CSIM 135 ns

ID: R5=0x5(5) fr ALU at CSIM 136 ns

IFU : mem=0x0

IFU : pc= 14 at CSIM 138 ns

ID: REGISTERS DUMP at CSIM 140 ns

```
REG :=====
R 0(00000000)  R 1(00000001)  R 2(fff000e2)  R 3(ffffffff)
R 4(00000004)  R 5(00000005)  R 6(0000000a)  R 7(fcf0fdef)
R 8(00000008)  R 9(00000009)  R10(00000010)  R11(0000ff31)
R12(0000ff12)  R13(00000013)  R14(00000014)  R15(00000015)
R16(00000016)  R17(00fe0117)  R18(00fe0118)  R19(00fe0119)
R20(00fe0220)  R21(00fe0321)  R22(00fe0322)  R23(00ff0423)
R24(00ff0524)  R25(00ff0625)  R26(00ff0726)  R27(00ff0727)
R28(00f70728)  R29(00000029)  R30(00000030)  R31(00000031)
=====
```

IFU : mem=0xf550000

IFU : pc= 15 at CSIM 145 ns

ID: R5=R5(=5)
: at CSIM 147 ns

ALU : op= 3 A= 5 B= 0
ALU : R= 5-> R5 at CSIM 149 ns

ID: R5=0x5(5) fr ALU at CSIM 150 ns

IFU : mem=0x0

IFU : pc= 16 at CSIM 152 ns

ID: REGISTERS DUMP at CSIM 154 ns

```
REG :=====
R 0(00000000)  R 1(00000001)  R 2(fff000e2)  R 3(ffffffff)
R 4(00000004)  R 5(00000005)  R 6(0000000a)  R 7(fcf0fdef)
R 8(00000008)  R 9(00000009)  R10(00000010)  R11(0000ff31)
R12(0000ff12)  R13(00000013)  R14(00000014)  R15(00000015)
R16(00000016)  R17(00fe0117)  R18(00fe0118)  R19(00fe0119)
R20(00fe0220)  R21(00fe0321)  R22(00fe0322)  R23(00ff0423)
R24(00ff0524)  R25(00ff0625)  R26(00ff0726)  R27(00ff0727)
R28(00f70728)  R29(00000029)  R30(00000030)  R31(00000031)
=====
```

IFU : mem=0xf550000

IFU : pc= 17 at CSIM 159 ns

ID: R5=R5(=5)
: at CSIM 161 ns

ALU : op= 3 A= 5 B= 0
ALU : R= 5-> R5 at CSIM 163 ns

ID: R5=0x5(5) fr ALU at CSIM 164 ns

IFU : mem=0x0

IFU : pc= 18 at CSIM 166 ns

ID: REGISTERS DUMP at CSIM 168 ns

```
REG :=====
R 0(00000000)  R 1(00000001)  R 2(fff000e2)  R 3(ffffffff)
R 4(00000004)  R 5(00000005)  R 6(0000000a)  R 7(fcf0fdef)
R 8(00000008)  R 9(00000009)  R10(00000010)  R11(0000ff31)
R12(0000ff12)  R13(00000013)  R14(00000014)  R15(00000015)
R16(00000016)  R17(00fe0117)  R18(00fe0118)  R19(00fe0119)
R20(00fe0220)  R21(00fe0321)  R22(00fe0322)  R23(00ff0423)
R24(00ff0524)  R25(00ff0625)  R26(00ff0726)  R27(00ff0727)
R28(00f70728)  R29(00000029)  R30(00000030)  R31(00000031)
=====
```

IFU : mem=0xf550000

IFU : pc= 19 at CSIM 173 ns

ID: R5=R5(=5)
: at CSIM 175 ns

ALU : op= 3 A= 5 B= 0
ALU : R= 5-> R5 at CSIM 177 ns

ID: R5=0x5(5) fr ALU at CSIM 178 ns

IFU : mem=0x0

IFU : pc= 1a at CSIM 180 ns

ID: REGISTERS DUMP at CSIM 182 ns

```
REG :=====
R 0(00000000)  R 1(00000001)  R 2(fff000e2)  R 3(ffffffff)
R 4(00000004)  R 5(00000005)  R 6(0000000a)  R 7(fcf0fdef)
R 8(00000008)  R 9(00000009)  R10(00000010)  R11(0000ff31)
R12(0000ff12)  R13(00000013)  R14(00000014)  R15(00000015)
R16(00000016)  R17(00fe0117)  R18(00fe0118)  R19(00fe0119)
R20(00fe0220)  R21(00fe0321)  R22(00fe0322)  R23(00ff0423)
R24(00ff0524)  R25(00ff0625)  R26(00ff0726)  R27(00ff0727)
R28(00f70728)  R29(00000029)  R30(00000030)  R31(00000031)
=====
```

IFU : mem=0xf550000

IFU : pc= 1b at CSIM 187 ns

ID: R5=R5(=5)
: at CSIM 189 ns

ALU : op= 3 A= 5 B= 0
ALU : R= 5-> R5 at CSIM 191 ns

ID: R5=0x5(5) fr ALU at CSIM 192 ns

IFU : mem=0x0

IFU : pc= 1c at CSIM 194 ns

ID: REGISTERS DUMP at CSIM 196 ns

```
REG :=====
R 0(00000000)  R 1(00000001)  R 2(fff000e2)  R 3(ffffffff)
R 4(00000004)  R 5(00000005)  R 6(0000000a)  R 7(fcf0fdef)
R 8(00000008)  R 9(00000009)  R10(00000010)  R11(0000ff31)
R12(0000ff12)  R13(00000013)  R14(00000014)  R15(00000015)
R16(00000016)  R17(00fe0117)  R18(00fe0118)  R19(00fe0119)
R20(00fe0220)  R21(00fe0321)  R22(00fe0322)  R23(00ff0423)
R24(00ff0524)  R25(00ff0625)  R26(00ff0726)  R27(00ff0727)
R28(00f70728)  R29(00000029)  R30(00000030)  R31(00000031)
=====
```

IFU : mem=0x2550001

IFU : pc= 1d at CSIM 201 ns

ID: R5= R5(=5)+1
: at CSIM 203 ns

ALU : op= 3 A= 5 B= 1
ALU : R= 6-> R5 at CSIM 205 ns

ID: R5=0x6(6) fr ALU at CSIM 206 ns

IFU : mem=0x0

IFU : pc= 1e at CSIM 208 ns

ID: REGISTERS DUMP at CSIM 210 ns

```
REG :=====
R 0(00000000)  R 1(00000001)  R 2(fff000e2)  R 3(ffffffff)
R 4(00000004)  R 5(00000006)  R 6(0000000a)  R 7(fcf0fdef)
R 8(00000008)  R 9(00000009)  R10(00000010)  R11(0000ff31)
R12(0000ff12)  R13(00000013)  R14(00000014)  R15(00000015)
R16(00000016)  R17(00fe0117)  R18(00fe0118)  R19(00fe0119)
R20(00fe0220)  R21(00fe0321)  R22(00fe0322)  R23(00ff0423)
R24(00ff0524)  R25(00ff0625)  R26(00ff0726)  R27(00ff0727)
R28(00f70728)  R29(00000029)  R30(00000030)  R31(00000031)
=====
```

IFU : mem=0x1156fffa

IFU : pc= 1f at CSIM 215 ns

ID: bne R5(=6), R6(=10), pc+=(-6).
ID: at CSIM 217 ns

ALU : op= 3 A= 0 B= 0
ALU : R= 0-> R0 at CSIM 219 ns

ID: R0=0x0(0) fr ALU at CSIM 220 ns

IFU : mem=0x0

IFU : pc= 20 at CSIM 222 ns

IFU ALERT: **BRANCH**

ID: REGISTERS DUMP at CSIM 224 ns

```
REG :=====
R 0(00000000)  R 1(00000001)  R 2(fff000e2)  R 3(ffffffff)
R 4(00000004)  R 5(00000006)  R 6(0000000a)  R 7(fcf0fdef)
R 8(00000008)  R 9(00000009)  R10(00000010)  R11(0000ff31)
R12(0000ff12)  R13(00000013)  R14(00000014)  R15(00000015)
R16(00000016)  R17(00fe0117)  R18(00fe0118)  R19(00fe0119)
R20(00fe0220)  R21(00fe0321)  R22(00fe0322)  R23(00ff0423)
R24(00ff0524)  R25(00ff0625)  R26(00ff0726)  R27(00ff0727)
R28(00f70728)  R29(00000029)  R30(00000030)  R31(00000031)
=====
```

IFU : mem=0x0

IFU : pc= 20 at CSIM 229 ns

ID: REGISTERS DUMP at CSIM 231 ns

```
REG :=====
R 0(00000000)  R 1(00000001)  R 2(fff000e2)  R 3(ffffffff)
R 4(00000004)  R 5(00000006)  R 6(0000000a)  R 7(fcf0fdef)
R 8(00000008)  R 9(00000009)  R10(00000010)  R11(0000ff31)
R12(0000ff12)  R13(00000013)  R14(00000014)  R15(00000015)
R16(00000016)  R17(00fe0117)  R18(00fe0118)  R19(00fe0119)
R20(00fe0220)  R21(00fe0321)  R22(00fe0322)  R23(00ff0423)
R24(00ff0524)  R25(00ff0625)  R26(00ff0726)  R27(00ff0727)
R28(00f70728)  R29(00000029)  R30(00000030)  R31(00000031)
=====
```

IFU ALERT: **BRANCH**

IFU : mem=0x0

IFU : pc= 20 at CSIM 237 ns

ID: clear branch at CSIM 238 ns

ID: REGISTERS DUMP at CSIM 239 ns

```
REG :=====
R 0(00000000)  R 1(00000001)  R 2(fff000e2)  R 3(ffffffff)
R 4(00000004)  R 5(00000006)  R 6(0000000a)  R 7(fcf0fdef)
R 8(00000008)  R 9(00000009)  R10(00000010)  R11(0000ff31)
R12(0000ff12)  R13(00000013)  R14(00000014)  R15(00000015)
R16(00000016)  R17(00fe0117)  R18(00fe0118)  R19(00fe0119)
R20(00fe0220)  R21(00fe0321)  R22(00fe0322)  R23(00ff0423)
R24(00ff0524)  R25(00ff0625)  R26(00ff0726)  R27(00ff0727)
R28(00f70728)  R29(00000029)  R30(00000030)  R31(00000031)
=====
```

IFU : mem=0x1123000

IFU : pc= 21 at CSIM 244 ns

ID: R1= R2(=-1048350)+R3(=-1)
: at CSIM 246 ns

ALU : op= 3 A= -1048350 B= -1
ALU : R= -1048351-> R1 at CSIM 248 ns

ID: R1=0xffff000e1(-1048351) fr ALU at CSIM 249 ns

IFU : mem=0x0

IFU : pc= 22 at CSIM 251 ns

ID: REGISTERS DUMP at CSIM 253 ns

```
REG :=====
R 0(00000000)  R 1(fff000e1)  R 2(fff000e2)  R 3(ffffffff)
R 4(00000004)  R 5(00000006)  R 6(0000000a)  R 7(fcf0fdef)
R 8(00000008)  R 9(00000009)  R10(00000010)  R11(0000ff31)
R12(0000ff12)  R13(00000013)  R14(00000014)  R15(00000015)
R16(00000016)  R17(00fe0117)  R18(00fe0118)  R19(00fe0119)
R20(00fe0220)  R21(00fe0321)  R22(00fe0322)  R23(00ff0423)
R24(00ff0524)  R25(00ff0625)  R26(00ff0726)  R27(00ff0727)
R28(00f70728)  R29(00000029)  R30(00000030)  R31(00000031)
=====
```

IFU : mem=0x1234000

IFU : pc= 23 at CSIM 258 ns

ID: R2= R3(=-1)+R4(=4)
: at CSIM 260 ns

ALU : op= 3 A= -1 B= 4
ALU : R= 3-> R2 at CSIM 262 ns

ID: R2=0x3(3) fr ALU at CSIM 263 ns

IFU : mem=0x0

IFU : pc= 24 at CSIM 265 ns

ID: REGISTERS DUMP at CSIM 267 ns

```
REG :=====
R 0(00000000)  R 1(fff000e1)  R 2(00000003)  R 3(ffffffff)
R 4(00000004)  R 5(00000006)  R 6(0000000a)  R 7(fcf0fdef)
R 8(00000008)  R 9(00000009)  R10(00000010)  R11(0000ff31)
R12(0000ff12)  R13(00000013)  R14(00000014)  R15(00000015)
R16(00000016)  R17(00fe0117)  R18(00fe0118)  R19(00fe0119)
R20(00fe0220)  R21(00fe0321)  R22(00fe0322)  R23(00ff0423)
R24(00ff0524)  R25(00ff0625)  R26(00ff0726)  R27(00ff0727)
R28(00f70728)  R29(00000029)  R30(00000030)  R31(00000031)
=====
```

```
-----
IFU : mem=0xffffffff
IFU : pc= 25 at CSIM 272 ns
-----
```

```
-----
ID: - SHUTDOWN - at CSIM 274 ns
ID: - PLEASE WAIT ..... -
-----
```

```
////////////////////////////////////
SystemC: simulation stopped by user.
Time for simulation = 2
```

```
C:\SYSTEMC\TUTORIAL\RISC_CPU>
```

A6. MY WORKING RISC_CPU.BPR

```
<?xml version='1.0' encoding='utf-8' ?>
<!-- C++Builder XML Project -->
<PROJECT>
  <MACROS>
    <VERSION value="BCB.05.03"/>
    <PROJECT value="risc_cpu.exe"/>
    <OBJFILES value="main.obj bios.obj dcache.obj decode.obj exec.obj fetch.obj floating.obj
      icache.obj mmxu.obj paging.obj pic.obj"/>
    <RESFILES value=""/>
    <DEFFILE value=""/>
    <RESDEPEN value="$(RESFILES)"/>
    <LIBFILES value="..\..\Lib\systemc2.0.1.lib"/>
    <LIBRARIES value=""/>
    <SPARELIBS value="VCL50.lib VCLBDE50.lib vclldb50.lib"/>
    <PACKAGES value="VCL50.bpi VCLX50.bpi bcbsmp50.bpi QRPT50.bpi VCLDB50.bpi VCLBDE50.bpi
      ibsmp50.bpi VCLDBX50.bpi TEEUI50.bpi TEEDB50.bpi TEE50.bpi TEEQR50.bpi
      VCLIB50.bpi bcbie50.bpi VCLIE50.bpi INETDB50.bpi INET50.bpi NMFAST50.bpi
      dclocx50.bpi bcb2kaxserver50.bpi"/>
    <PATHCPP value="."/>
    <PATHPAS value="."/>
    <PATHRC value="."/>
    <PATHASM value="."/>
    <DEBUGLIBPATH value="$(BCB)\lib\debug"/>
    <RELEASELIBPATH value="$(BCB)\lib\release"/>
    <LINKER value="tlink32"/>
    <USERDEFINES value="_DEBUG"/>
    <SYSDEFINES value="NO_STRICT;_NO_VCL;_RTLDDLL;USEPACKAGES"/>
    <MAINSOURCE value="risc_cpu.bpf"/>
    <INCLUDEPATH value="..\..\Include;$(BCB)\include;$(BCB)\include\vcl"/>
    <LIBPATH value="..\..\Lib;$(BCB)\lib\obj;$(BCB)\lib"/>
    <WARNINGS value="-w-par"/>
  </MACROS>
  <OPTIONS>
    <CFLAG1 value="-X- -a8 -b -k -y -v -vi- -twC -twM- -c -DWIN32;NO_STRICT;_RTLDDLL"/>
    <PFLAGS value="-$YD -$W -$O- -v -JPHNE -M"/>
    <RFLAGS value=""/>
    <AFLAGS value="/mx /w2 /zd"/>
    <LFLAGS value="-D"&quot; -ap -Tpe -v /P256"/>
  </OPTIONS>
  <LINKER>
    <ALLOBJ value="c0x32.obj $(PACKAGES) $(OBJFILES)"/>
    <ALLRES value="$(RESFILES)"/>
    <ALLLIB value="$(LIBFILES) $(LIBRARIES) import32.lib cw32i.lib"/>
  </LINKER>
  <IDEOPTIONS>
    [Version Info]
    IncludeVerInfo=0
    AutoIncBuild=0
    MajorVer=1
    MinorVer=0
    Release=0
    Build=0
    Debug=0
    PreRelease=0
    Special=0
    Private=0
    DLL=0
    Locale=1033
    CodePage=1252

    [Version Info Keys]
    CompanyName=
    FileDescription=
    FileVersion=1.0.0.0
    InternalName=
    LegalCopyright=
    LegalTrademarks=
    OriginalFilename=
    ProductName=
    ProductVersion=1.0.0.0
    Comments=
```

```

[HistoryLists\hlIncludePath]
Count=8
Item0=...\Include;$(BCB)\include;$(BCB)\include\vc1
Item1=C:\SystemC\Include;C:\SystemC\Tutorial\risc_cpu;$(BCB)\include;$(BCB)\include\vc1
Item2=C:\SystemC\Tutorial\risc_cpu;$(BCB)\include;$(BCB)\include\vc1
Item3=$(BCB)\include;$(BCB)\include\vc1
Item4=...\systemc2.0.1-src-borland\Include;$(BCB)\include;$(BCB)\include\vc1
Item5=$(BCB)\include;$(BCB)\include\vc1;...\systemc2.0.1-src-borland\Include
Item6=$(BCB)\include;$(BCB)\include\vc1;C:\SystemC\systemc2.0.1-src-borland\Include
Item7=C:\Program Files\Borland\CBUILDER5\231101\;\CHIPESNT\DRGS\lihong\Code StoreRoom\Classes and
Methods\231101;C:\Program Files\Borland\CBUILDER5\Projects\;\CHIPESNT\DRGS\lihong\Code
StoreRoom\Classes and Methods;$(BCB)\include;$(BCB)\include\vc1

[HistoryLists\hlLibraryPath]
Count=9
Item0=...\Lib;$(BCB)\lib\obj;$(BCB)\lib
Item1=C:\SystemC\Lib;C:\SystemC\Tutorial\risc_cpu;$(BCB)\lib\obj;$(BCB)\lib
Item2=C:\SystemC\Tutorial\risc_cpu;$(BCB)\lib\obj;$(BCB)\lib
Item3=$(BCB)\lib\obj;$(BCB)\lib
Item4=...\systemc2.0.1-src-borland\Lib;$(BCB)\lib\obj;$(BCB)\lib
Item5=$(BCB)\lib\obj;$(BCB)\lib;...\systemc2.0.1-src-borland\Lib
Item6=$(BCB)\lib\obj;$(BCB)\lib;C:\SystemC\systemc2.0.1-src-borland\Lib
Item7=$(BCB)\lib;$(BCB)\lib\obj;...\systemc2.0.1-src-borland\Lib
Item8=C:\Program Files\Borland\CBUILDER5\231101\;\CHIPESNT\DRGS\lihong\Code StoreRoom\Classes and
Methods\231101;C:\Program Files\Borland\CBUILDER5\Projects\;\CHIPESNT\DRGS\lihong\Code
StoreRoom\Classes and Methods;$(BCB)\lib\obj;$(BCB)\lib

[HistoryLists\hlDebugSourcePath]
Count=1
Item0=$(BCB)\source\vc1

[HistoryLists\hlConditionals]
Count=1
Item0=_DEBUG

[Debugging]
DebugSourceDirs=$(BCB)\source\vc1

[Parameters]
RunParams=
HostApplication=
RemoteHost=
RemotePath=
RemoteDebug=0

[Compiler]
ShowInfoMsgs=0
LinkDebugVcl=0
LinkCGLIB=0

[Language]
ActiveLang=
ProjectLang=
RootDir=
</IDEOPTIONS>
</PROJECT>

```