SIMTEC ELECTRONICS

ABLE PlayXSVF User Guide

Simtec Electronics

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Revision History

Revision 1.00	5th September 2005	VRS

Initial Release.

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ABLE PlayXSVF

About this document. This document describes the Simtec PlayXSVF utility for the EB675001DIP Development. The utility allows pre generated XSVF formatted JTAG files to be written to the EB675001DIP user CPLD without an external JATG programmer.

Intended Audience. This document is aimed at experienced engineers.

Related documents. Some additional documents which may be useful:

Xilinx XSVF Appnote [http://direct.xilinx.com/bvdocs/appnotes/xapp503.pdf]
1149.1-2001 IEEE Standard Test Access Port and Boundary-Scan Architecture
EB675001DIP User Guide [http://www.simtec.co.uk/products/EB675001DIP/files/user/index.html]
Bootstraping EB675001DIP [http://www.simtec.co.uk/products/EB675001DIP/files/EB675001DIP-bootstrap.html]
Connector and link pinouts. [http://www.simtec.co.uk/products/EB675001DIP/files/pinlist.html]
Memory map and control registers. [http://www.simtec.co.uk/products/EB675001DIP/files/mmap.html]
Mechanical Drawing [http://www.simtec.co.uk/products/EB675001DIP/files/EB675001DIP-mechanical.pdf]

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The document title
The document revision
A clear explanation of your comments and how they apply

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Chapter 1. Overview

The EB675001DIP has a user programable CPLD (Xilinx XC9572XL). This device may be reprogrammed in ciruit without the use of additional JTAG programmer hardware. Reprogramming is performed by the PlayXSVF utility.

The Simtec Electronics Advanced Boot Load Enviroment (ABLE) supports the execution of external utilities. The PlayXSVF utility uses this feature. Typical operation is to run the utility from a tftp server and obtain the XSVF file to program from the same source.

The generation of an XSVF file from the Impact utility (as provided in webpack 6.1) is discussed in some detail in the Chapter 2, *Generating XSVF*. The main points to note in the generating of the XSVF file is that the JTAG chain contains three devices, the OKI ML675001, the system CPLD and the User CPLD. The User CPLD should be the *only* device re-programmed or irreprable damage may be caused to the EB675001DIP.

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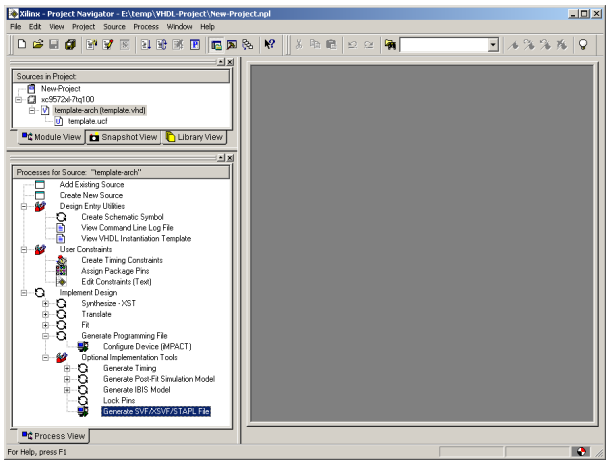
Chapter 2. Generating XSVF

The PlayXSVF utility requires a boundary scan JTAG file in the Xilinx® XSVF file format. The XSVF file format is a binary representation of the standard Serial Vector Format (SVF). The formats and their differences are described fully in the Xilinx XSVF Appnote [http://direct.xilinx.com/bvdocs/appnotes/xapp503.pdf].

Generating the XSVF file is easily performed using the Xilinx® WebPACK® tools. The worked example presented here should provide the reader with enough guidance to produce the results they require.

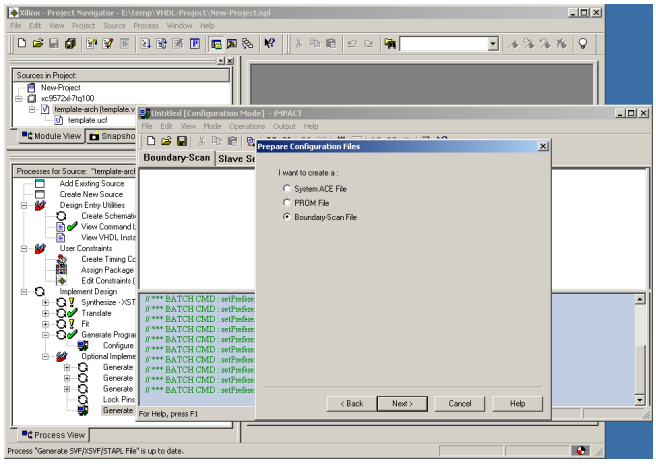
A project is opened in the WebPACK® project navigator (in this case the user CPLD VHDL template file provided on the EB675001DIP resources web page). The "Implement Design" selector allows the "Optional Implementation Tools" list to be expanded. The "Generate SVF/XSVF/STAPL File" action should then be selected and run (typically by double clicking).

Figure 2.1. WebPACK® navigator tool selection



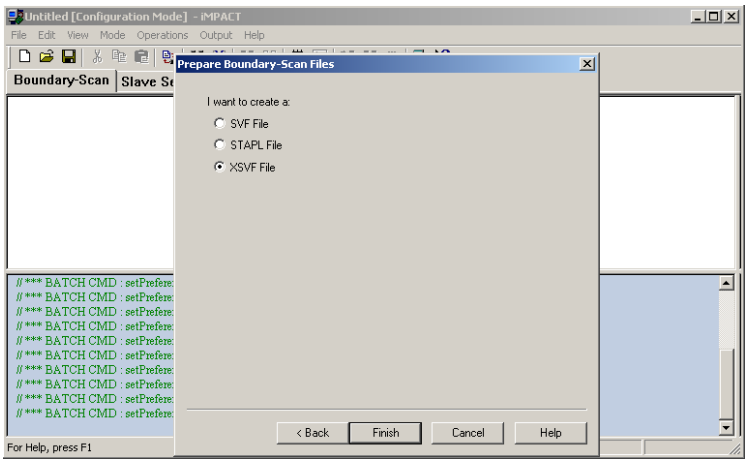
If not already built the WebPACK® tools will run and synthesise, translate, fit and generate a programming file, this can be seen from icons appearing next to each stage in the "Implement Design" section of the navigator. The Impact utility will then be started and a prompt for the type of file to create will be shown. The "Boundary-Scan File" option should be selected and the "next" button clicked.

Figure 2.2. Impact prompting for file type



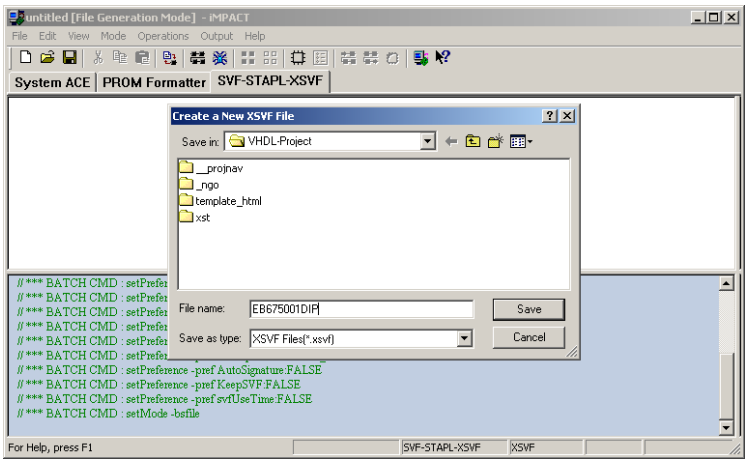
Impact will prompt for the type of Boundary scan file. Select the "XSVF File" option and the "Finish" button.

Figure 2.3. Impact prompting for Boundary-Scan file type



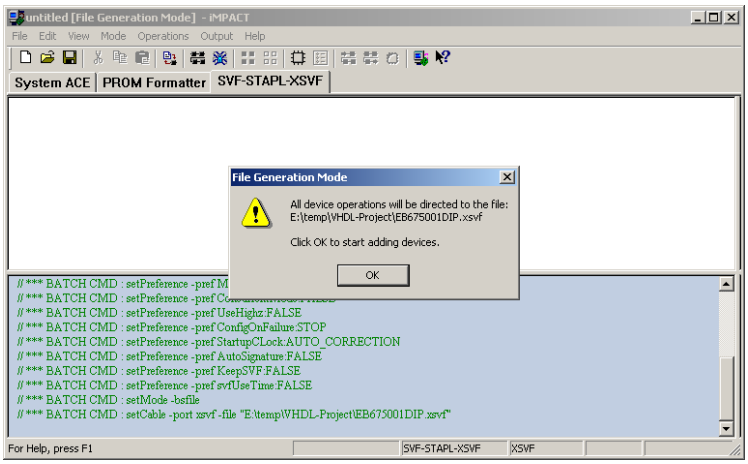
Impact will prompt for the name of the XSVF file to save. Provide a suitable file name and click on the save button.

Figure 2.4. Impact prompting for Boundary-Scan file name



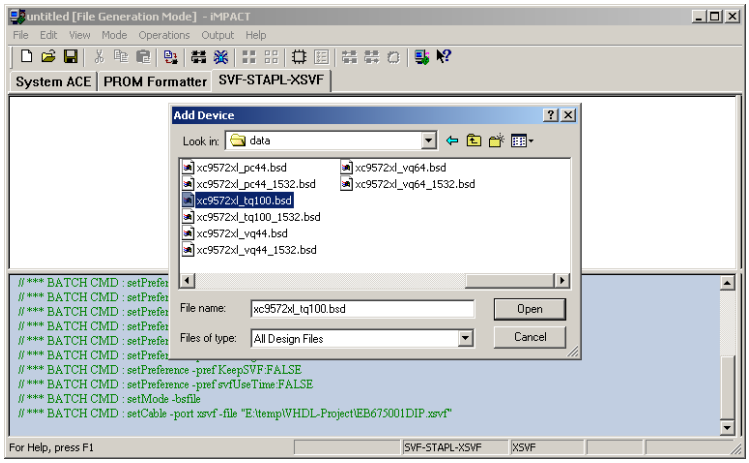
Impact will confirm the location of the XSVF file. The dialog should be closed by clicking the "OK" button.

Figure 2.5. Impact confirming XSVF file location



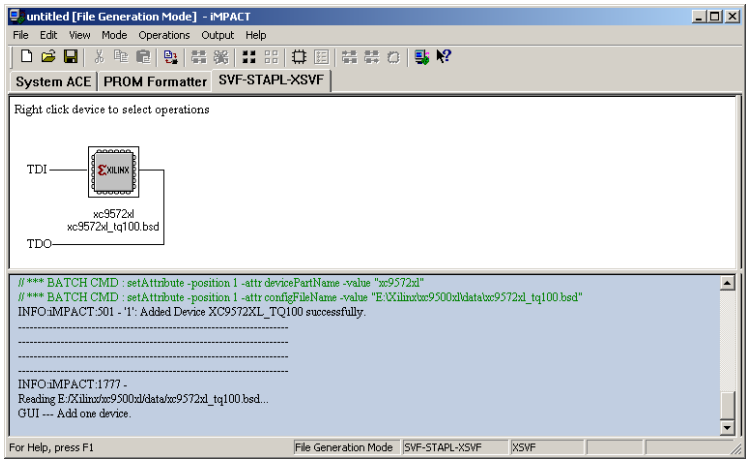
Impact will next prompt for the location of a design file of the CPLD to be programmed. This is typically located within the Xilinx® install directory for example `c:\Xilinx\xc9500xl\data\xc9572xl_tq100.bsd`. The appropriate file should be selected and the "Open" button pressed.

Figure 2.6. Selecting the CPLD BSDL file in impact



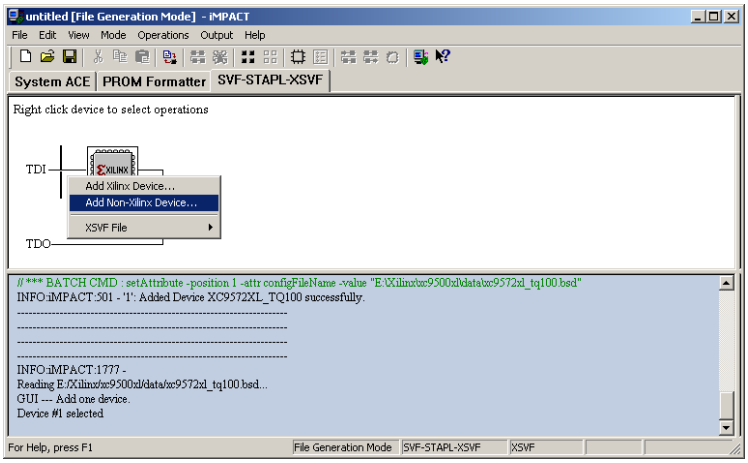
Impact will now display an diagram showing a JTAG chain with a single xc9572xl.

Figure 2.7. Impact showing added CPLD



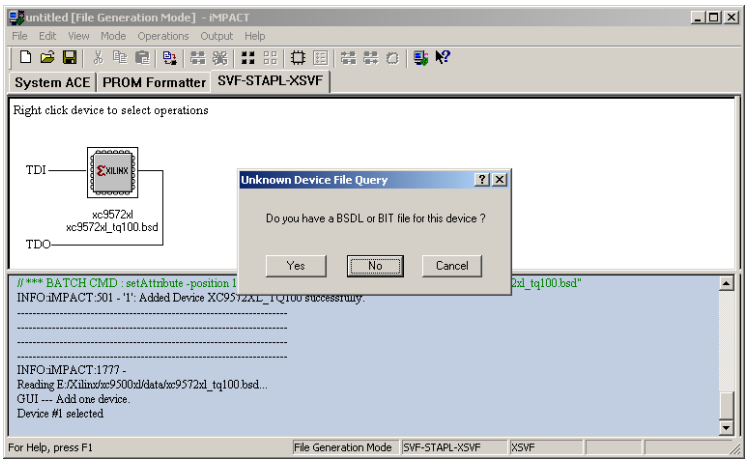
The JTAG chain needs to be extended to include the ML675001 processor. The flashing cursor should be placed to the left of the xc9572xl icon with a button click. The right mouse button should be pressed to open a menu and the "Add Non-Xilinx Device..." entry selected.

Figure 2.8. Adding ML675001 to JTAG chain



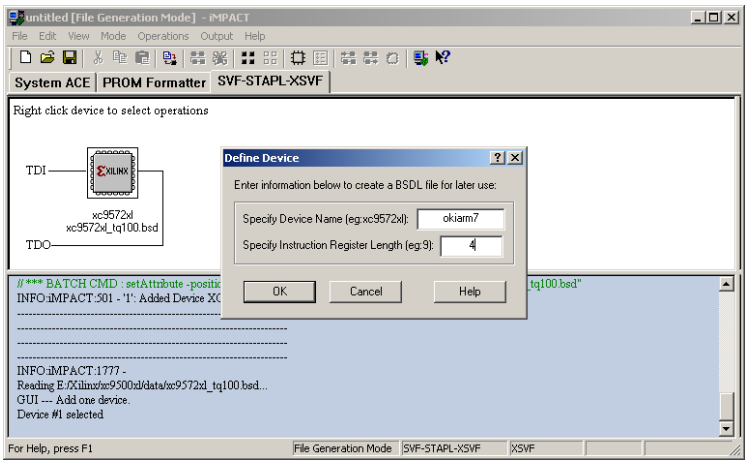
Impact will prompt for a BSDL design file for the OKI ML675001. A design file in not required to successfully generate user CPLD XSVF programming files, select the "No" option.

Figure 2.9. Impact prompting for unknown device



Impact will prompt to enter the information to define the ML675001. Enter a suitable name for the device such as "oki-arm7" and enter 4 for the Register Length and select "OK"

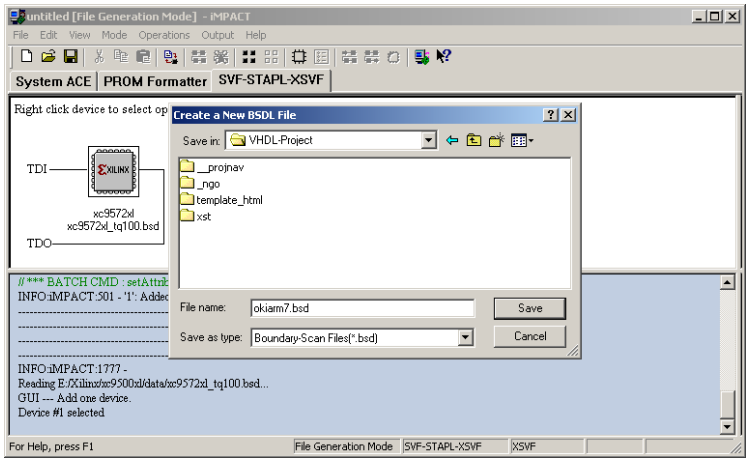
Figure 2.10. Defining ML675001 BSDL information



Impact will prompt for a location to save the generated BSDL file, select a suitable location (typically within your project

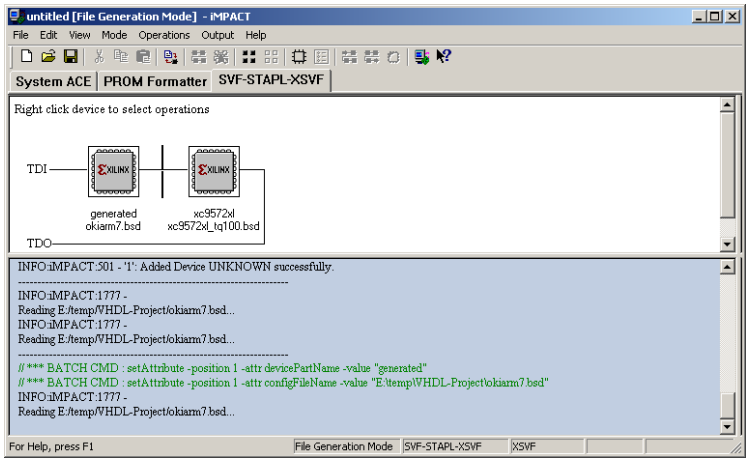
directory) and select "Save"

Figure 2.11. Selecting save location for OKI BSDL file



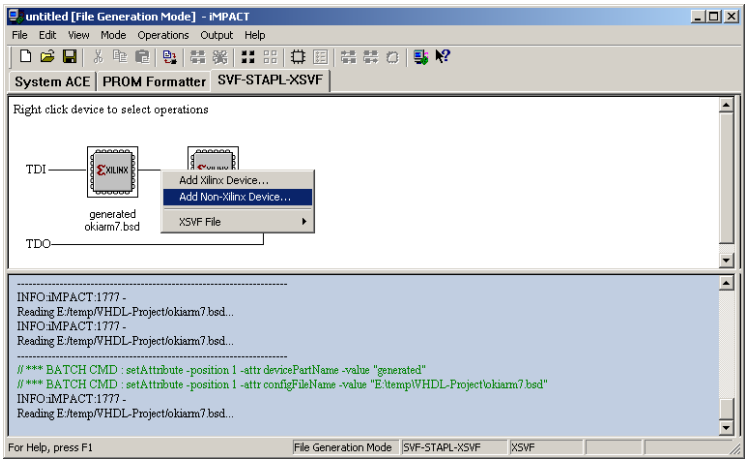
Impact will now display an diagram showing a JTAG chain with the OKI ML675001 followed by the Xilinx® xc9572xl.

Figure 2.12. Impact showing added ML675001



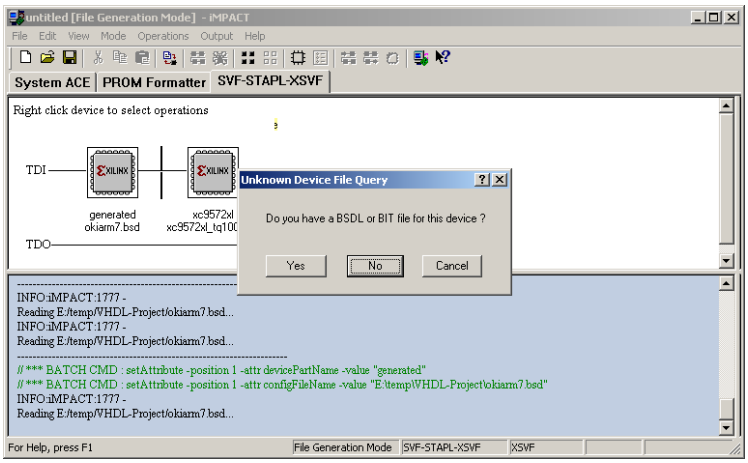
The JTAG chain needs to be further extended to include the system CPLD. The flashing cursor should be placed between the OKI ML675001 icon and the xc9572xl icon with a button click. The right mouse button should be pressed to open a menu and the "Add Non-Xilinx Device..." entry selected.

Figure 2.13. Adding the system CPLD to the JTAG chain



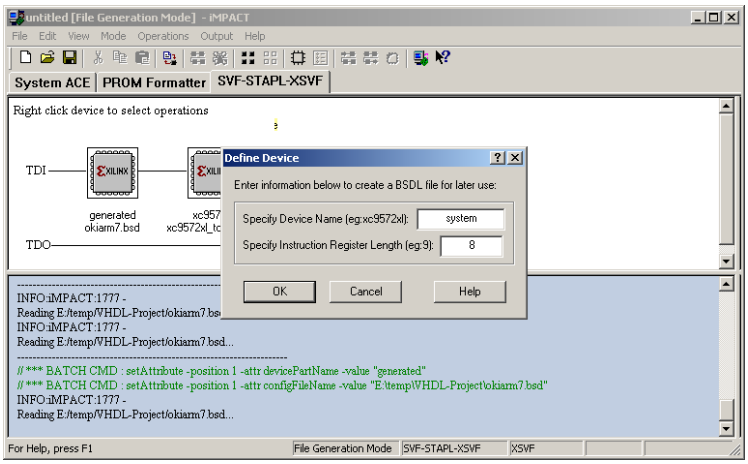
Impact will prompt for a BSDL design file for the system CPLD. A design file in not required to successfully generate user CPLD XSVF programming files, select the "No" option.

Figure 2.14. Impact prompting for unknown device



Impact will prompt to enter the information to define the system CPLD. Enter a suitable name for the device such as "system" and enter 8 for the Register Length and select "OK"

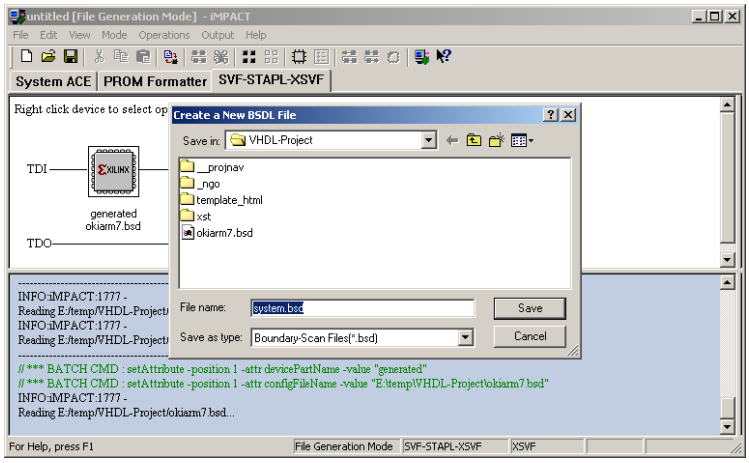
Figure 2.15. Defining system CPLD BSDL information



Impact will prompt for a location to save the generated BSDL file, select a suitable location and filename (typically with-

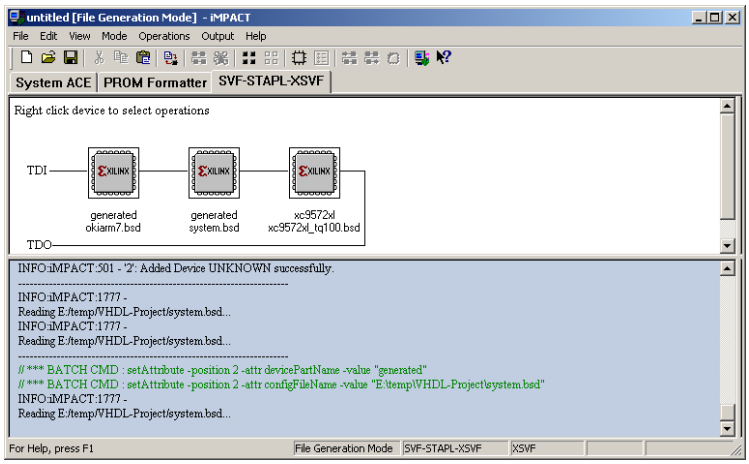
in your project directory) and select "Save"

Figure 2.16. Selecting save location for System CPLD BSDL file



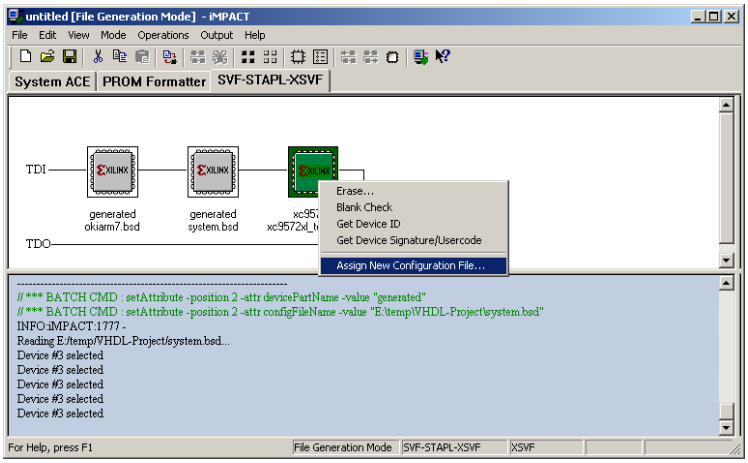
Impact will now display an diagram showing a JTAG chain with the OKI ML675001 followed by the system CPLD and finally the Xilinx® xc9572xl.

Figure 2.17. Impact showing added system CPLD



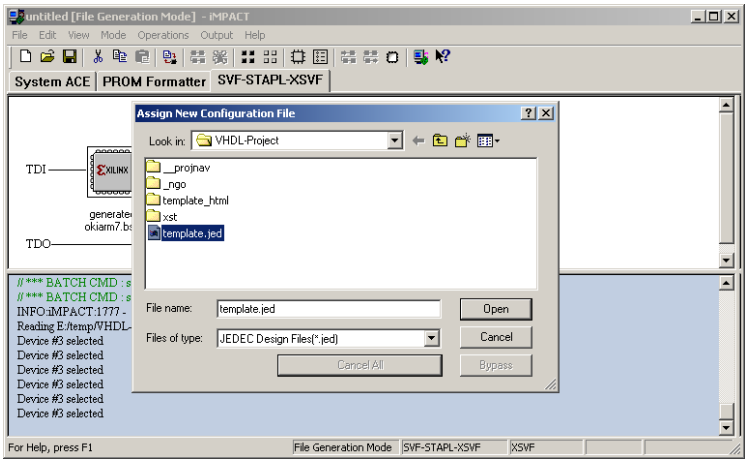
Once the JTAG chain has been constructed the next task is to assign a JEDEC configuration file to the user CPLD. The xc9572xl should be highlighted by clicking with the left mouse button. Once highlighted the right mouse button should be clicked which will open a menu, select "Assign New Configuration File..." from the menu.

Figure 2.18. Assigning a configuration file in Impact



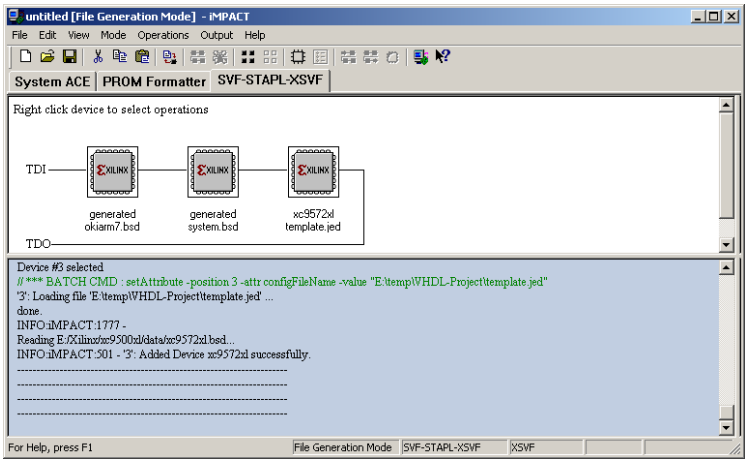
The "jed" file from your project should be selected and the open button selected.

Figure 2.19. Selecting a projects JEDEC design file



Impact will now display an diagram showing a JTAG chain with the OKI ML675001 followed by the system CPLD and finally the Xilinx xc9572xl with the selected JEDEC file name.

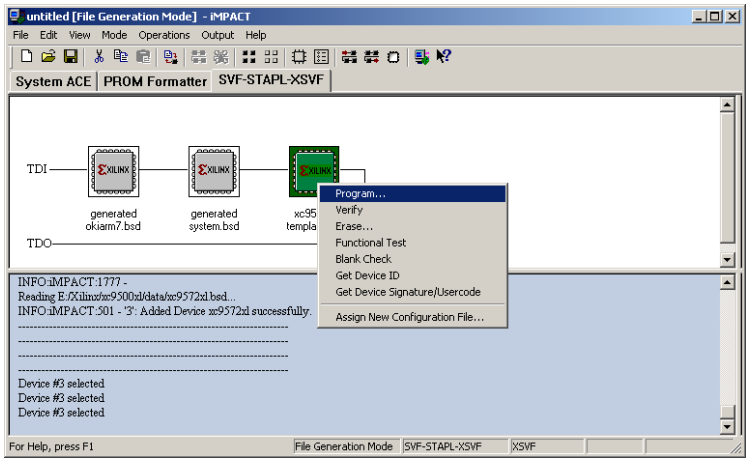
Figure 2.20. Impact showing added JEDEC design file



The final stage is to actually "program" the xc9572xl which will send all the programming actions to the XSVF file. The user CPLD should be selected with a left mouse click and the right mouse button used to open a menu, the "Program..."

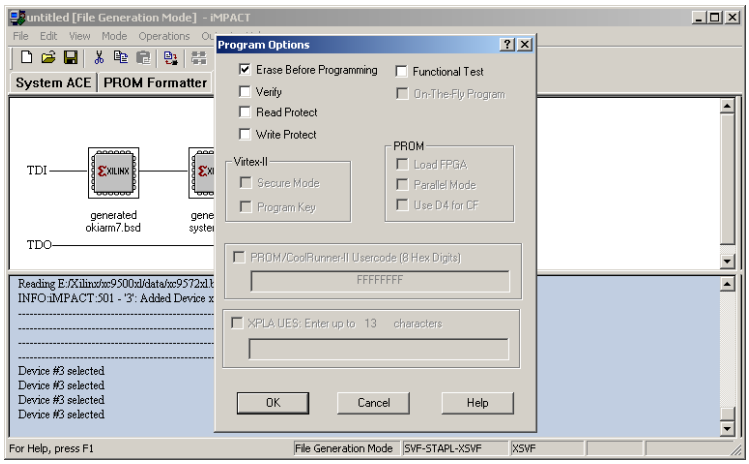
entry should be selected from the menu.

Figure 2.21. Selecting program from an Impact menu



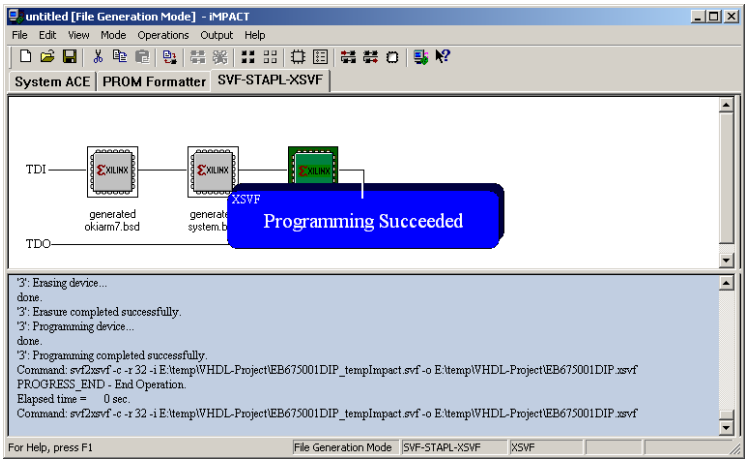
Impact will show the "Program Options" menu, typically all the options should remain unset apart from the "Erase Before Programming" selection. Once the required options have been selected the "OK" button should be selected.

Figure 2.22. Selecting programing options



The programmer will run and Impact will display the blue "Programming Succeeded" box.

Figure 2.23. Impact showing successful programming dialog



Impact may now be closed, Impact may prompt to save the JTAG chain, this can be useful if the task is to be repeated. The XSVF file is now available to use with the PlayXSVF utility.

Chapter 3. Programming User CPLD

Once a XSVF file has been created (Chapter 2, *Generating XSVF*) or downloaded the PlayXSVF utility can be used to perform the programming step. The utility effectively emulates a JTAG programmer attached to the external JTAG connector on the EB675001DIP.

Operation of the PlayXSVF is very simple, the utility and the XSVF file to be programmed are placed on a tftp server (similar to other ABLE operations) and run from the command line

Example 3.1. Using PlayXSVF to program the user CPLD

```
>(tftpboot)eb67dip-playxsvf-v100.bin (tftpboot)EB675001DIP.xsvf
....loaded (tftpboot)eb67dip-playxsvf-v100.bin, 0x8364 bytes at 0x00008000
boot: booting 'able app1'
XSVF Player v5.01, Xilinx, Inc.
OKI EB675001DIP version by Simtec Electronics
XSVF file = (tftpboot)EB675001DIP.xsvf
Loading '(tftpboot)EB675001DIP.xsvf'
...
Loaded 29025 bytes
new GPPMC is b8
confirmed b8
SUCCESS - Completed XSVF execution.
Cleaning up GPIO
>
```

Warning

Care *must* be taken to program the user CPLD with correct code, at the very least the CPLD must contain the nWait inversion logic as provided in the templates or networking operations will no longer work and an external JTAG programmer will be needed to reprogram the user CPLD.

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