

Tutorial for Digilent NEXYS 2 and Xilinx 12.3 with Linux/Debian

This tutorial was tested under Ubuntu 10.10.

1 Getting the software

What you need is:

- Xilinx ISE Design Suit 12 or later (WebPack License)
- UrJTAG (Universal JTAG library, server and tools) in version 0.10 or later (opensource)
- Digilent Adept Runtime in version 2.5.1 or later for Linux 32Bit/64Bit (free)
- Digilent Adept Utilities in version 2.1.1 or later for Linux 32Bit/64Bit (free)
- Digilent Plugin for Xilinx ISE 12 or later

1.1 Preparation of the operating system

Make sure you have following packages installed on your system:

```
sudo apt-get install libstdc++5 libmotif3 libxp6 libcurl3
```

For compiling software on your own you should have also done:

```
sudo apt-get install build-essentials
```

1.2 Xilinx ISE

Starting Point for getting Xilinx is <http://www.xilinx.com/webpack/>.

Select the free WebPack License Version and as a single download file.

A quick and fairly painless registration with Xilinx is required.

This is a huge download, a around 2 GB if I remember correctly!

Make sure you've got some time...

There is also a "Web Install Client", but that was much slower for me, and if you use it, the following procedure will be different.

Before you run the installation routine you must get needed runtime software.

These packages should also be available for other distros, such as SuSE.

```
sudo apt-get install fxload libftdi1
```

Afterwards you can untar the downloaded single archive

```
tar xf FILENAME.tar
```

```
cd NEWDIRECTORY
```

and run

```
chmod +x ./xsetup
```

```
sudo ./xsetup
```

in the current installation directory to the final destination `/opt/Xilinx/12.X/`.

1.3 UrJTAG

This package conflicts with the UrJTAG tools that we will install in the next step, and development has been discontinued in favor of UrJTAG anyway.

```
sudo apt-get remove openwinice-jtag
```

You can download from <http://urjtag.sourceforge.net/> the newest version and compile it your self.

```

tar xzf urjtag-VERSION.tar.gz
cd urjtag-VERSION
./configure
make
sudo make install

```

Currently we have created a binary package for debian based systems in version 0.10 of UrJTAG for 32Bit, so for the lazy one:

```
sudo dpkg -i urjtag_0.10-1_i386.deb
```

1.4 Digilent Adept

The three Packages listed above you can get from www.digilentinc.com under the section products/software. Then you must uncompress the Runtime firstly, then the Utilities and execute in each directory case

```
sudo bash install.sh
```

with only hitting enter to set default configuration and paths.

Then you get the Xilinx Plugin right by copying the whole directory, for example:

```
cp
```

(from)

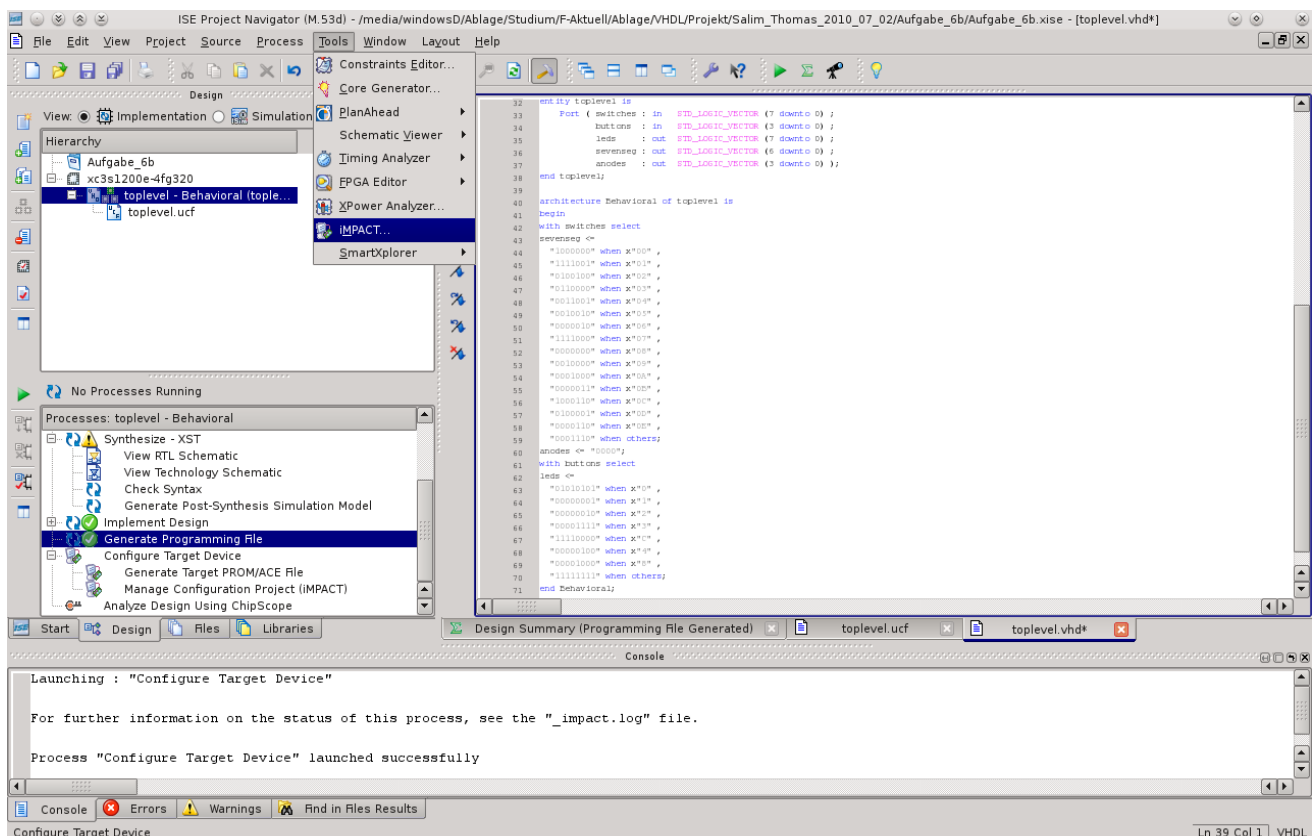
```
./libCseDigilent_[*version*]-i686/ISE[*correspond-version*]/plugin
```

(to)

```
/opt/Xilinx/12.1/ISE_DS/ISE/lib/lin/plugins/Digilent/libCseDigilent
```

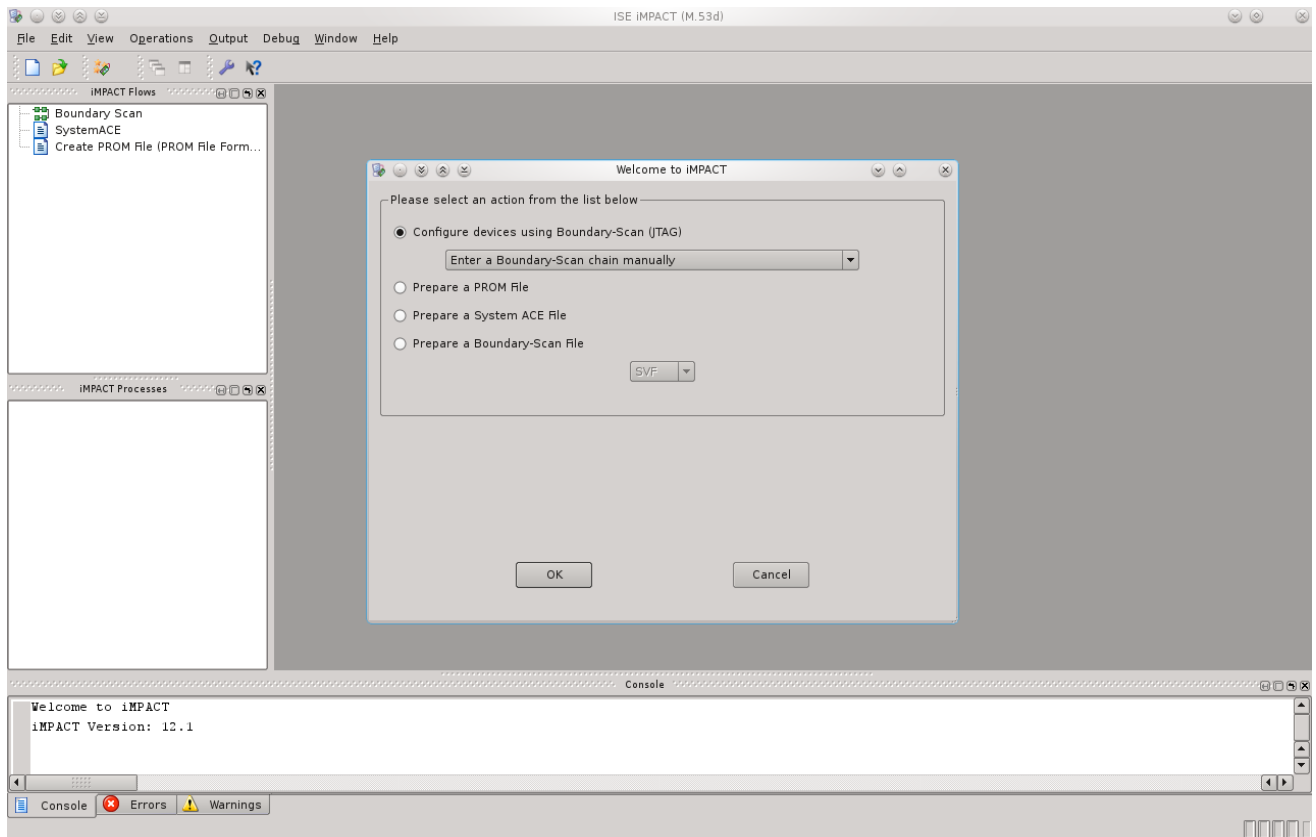
2 Programming with JTAG over USB with Xilinx

After you have successfully compiled and generated your bit file in your Project in Xilinx ISE, you can start the Impact Tool in the menu..

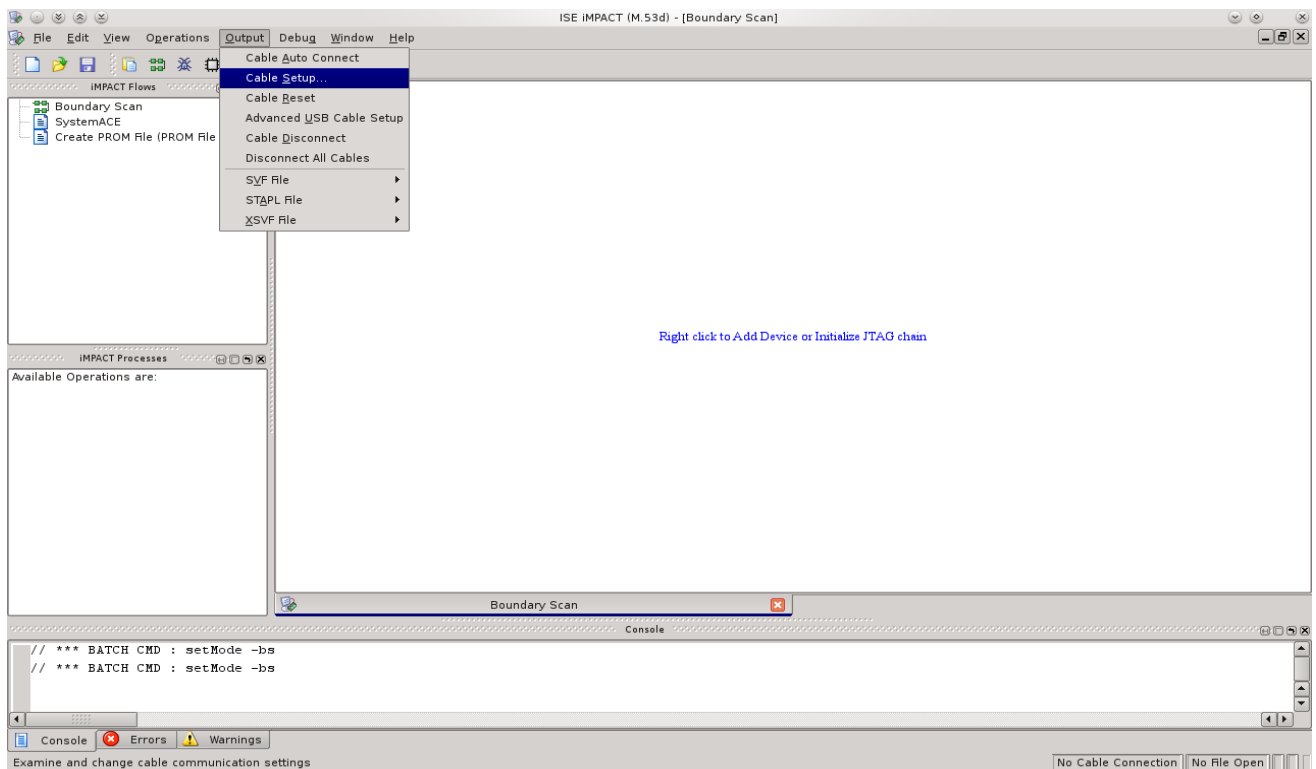


Xilinx Impact is used to download FPGA bitstreams to FPGA boards.
(Ignore the starting error message for the programmer chain initialisation.)

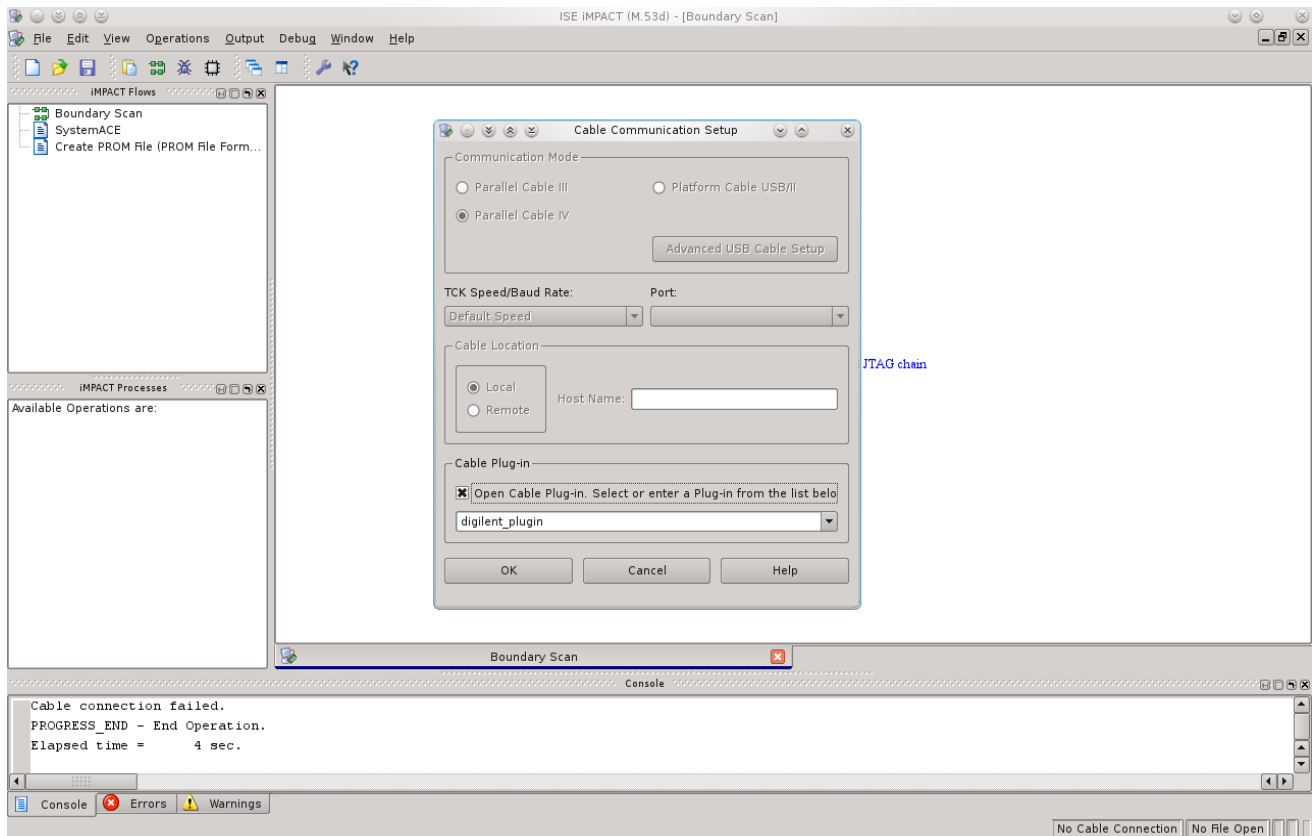
Select a new project, set up like in the screenshot below and make okey:



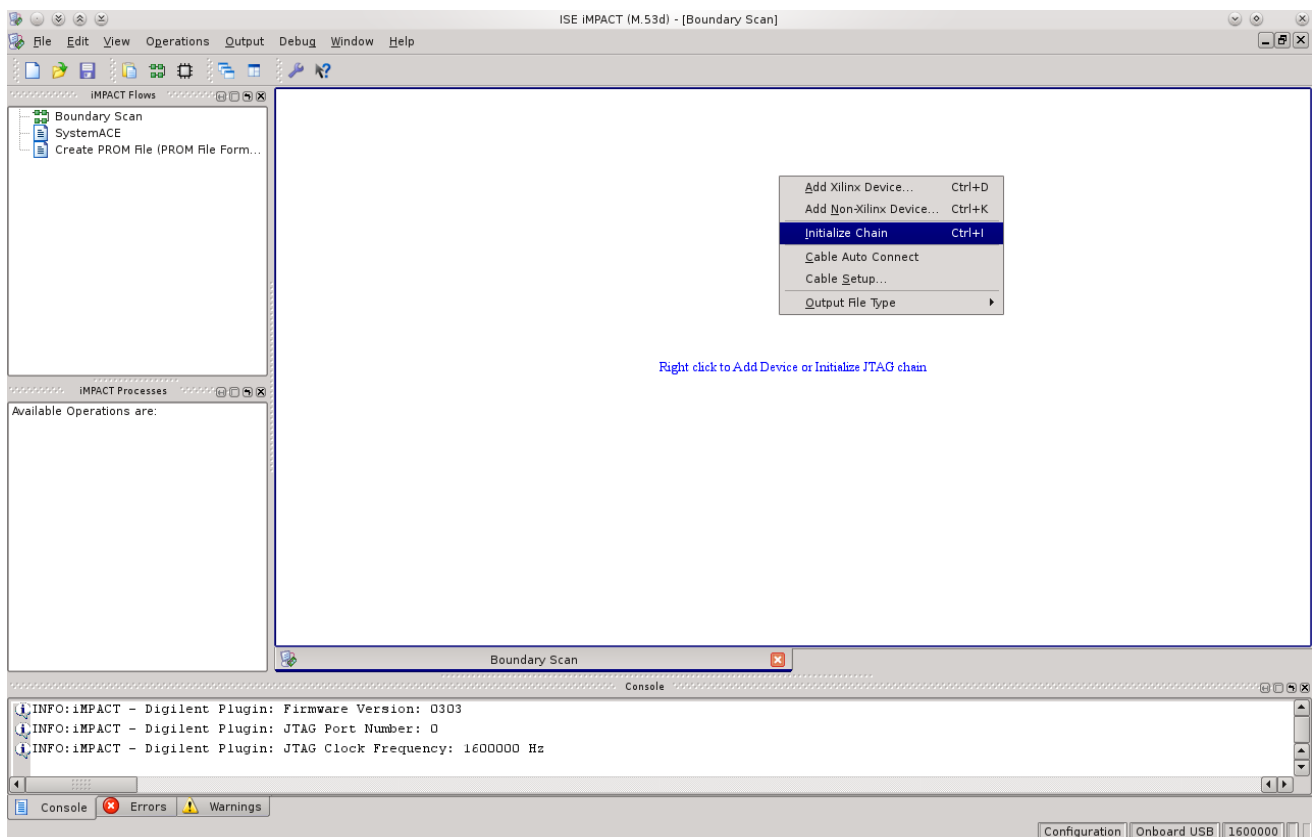
The following steps show how to use Impact with the Plug-in.
Select "Output Cable Setup..." menu item.



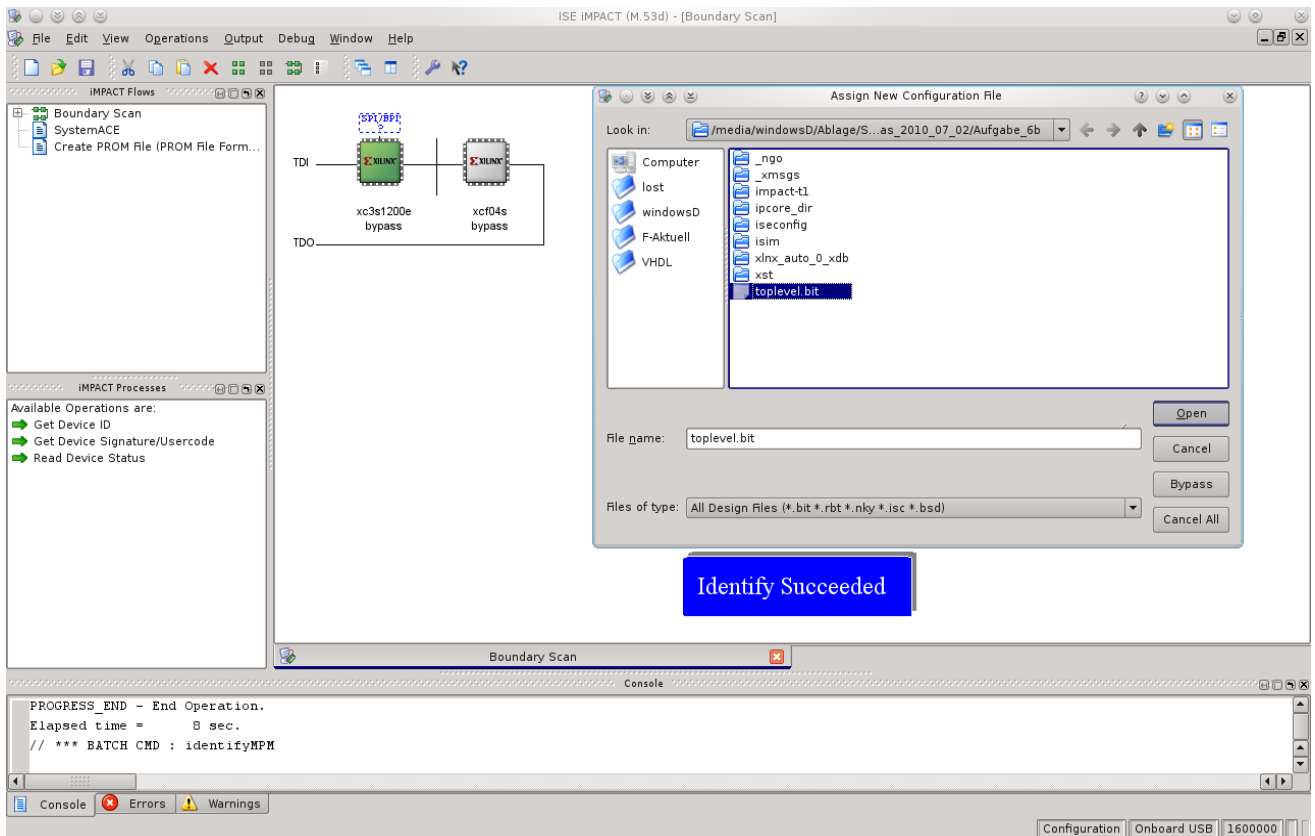
Select or enter manually the **digilent_plugin** in the input box



then you must initialise the JTAG boundary scan chain:



You will be asked for a bit file that you have compiled for the board, so click okey and select one:



Maybe you have also a not necessary PROM file to transfere it via SPI, we say no and continue to the end changing nothing.

Now you can download your Code to the Digilent Nexys 2 Board out of Xilinx by double clicking on Programm. I hope this tutorial served you well.

