
FOBOS

Release 2.0

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FOBOS Documentation

The Flexible Opensource workBench fOr Side-channel analysis FOBOS is an SCA platform.

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INTRODUCTION

The Flexible Opensource workBench fOr Sidechannel analysis (FOBOS) is a platform that can be used for side channel analysis. You can perform trace collection (Data Acquisition) and attacks (Data Analysis). The system is suitable for educational and research purposes.

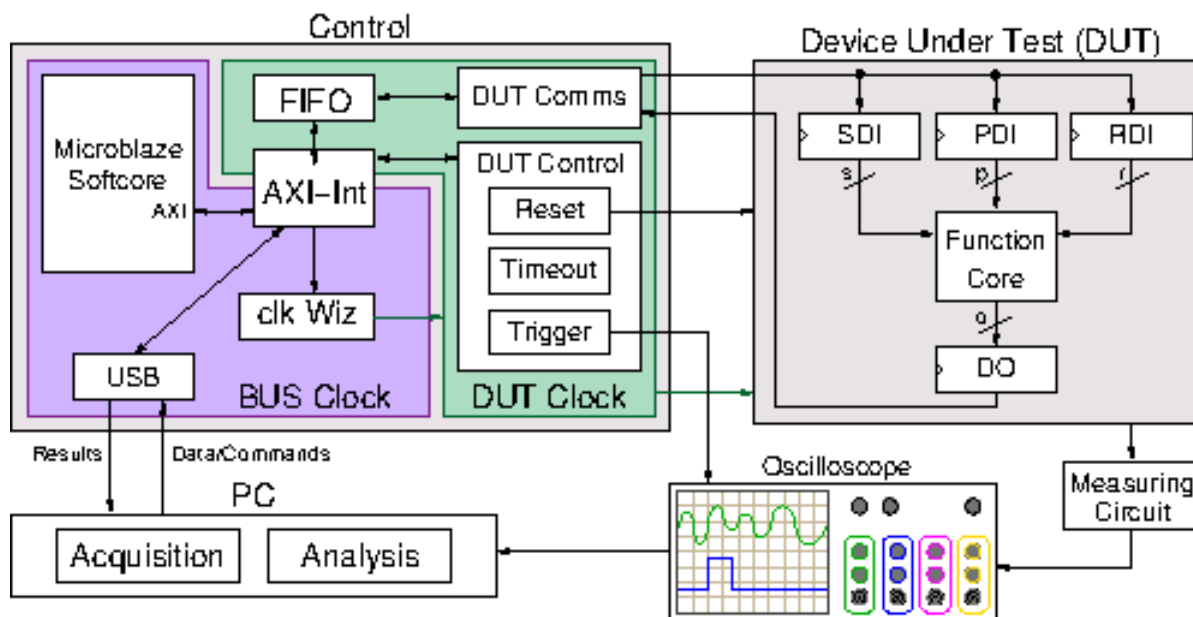


Fig. 1: FOBOS Block Diagram

1.1 Feature Overview

- Separate control and (Design Under Test) boards allowing addition of new DUTs easily.
- Uses commercial over-the-shelf boards to when possible to reduce cost.
- Digilent Basys3 and Nexys A7 control board.
- DUT support includes Diginelt Nexys3 board (Xilinx Spartan6) and compatible with NewAE CW305 (Xilinx Artix7 boards).
- Adjustable DUT clock.
- Adjustable trigger signal.
- Scripts to perform Differential Power Analysis (DPA).

- Leakage assessment using t-test.

QUICK START

Below, we describe how to setup FOBOS hardware and software and test that everything is working.

2.1 Requirements

1. Digilent Basys3 board
2. A PC with Linux installed
3. Python2 installed
4. Xilinx Vivado 2017.2

2.2 Software Installation

Note: The following installation procedure is tested on Linux Ubuntu 16.04.

1. Download FOBOS from the [FOBOS home page](#).
2. Extract the archive into the directory of your choice

```
$ tar xvfz fobos-v2.0.tgz
```

3. Use the following commands to install the necessary Python packages:

```
$ sudo apt-get install python-pip
$ sudo pip install numpy
$ sudo pip install pyserial
$ sudo pip install matplotlib
$ sudo pip install scipy
$ sudo pip install configparser
```

2.3 Hardware Setup

1. Build the control board Vivado project.

```
$ cd path-to-fobos/capture/ctrl/basys3ctrl/vivado
$ make
```

2. Open the project created using Vivado

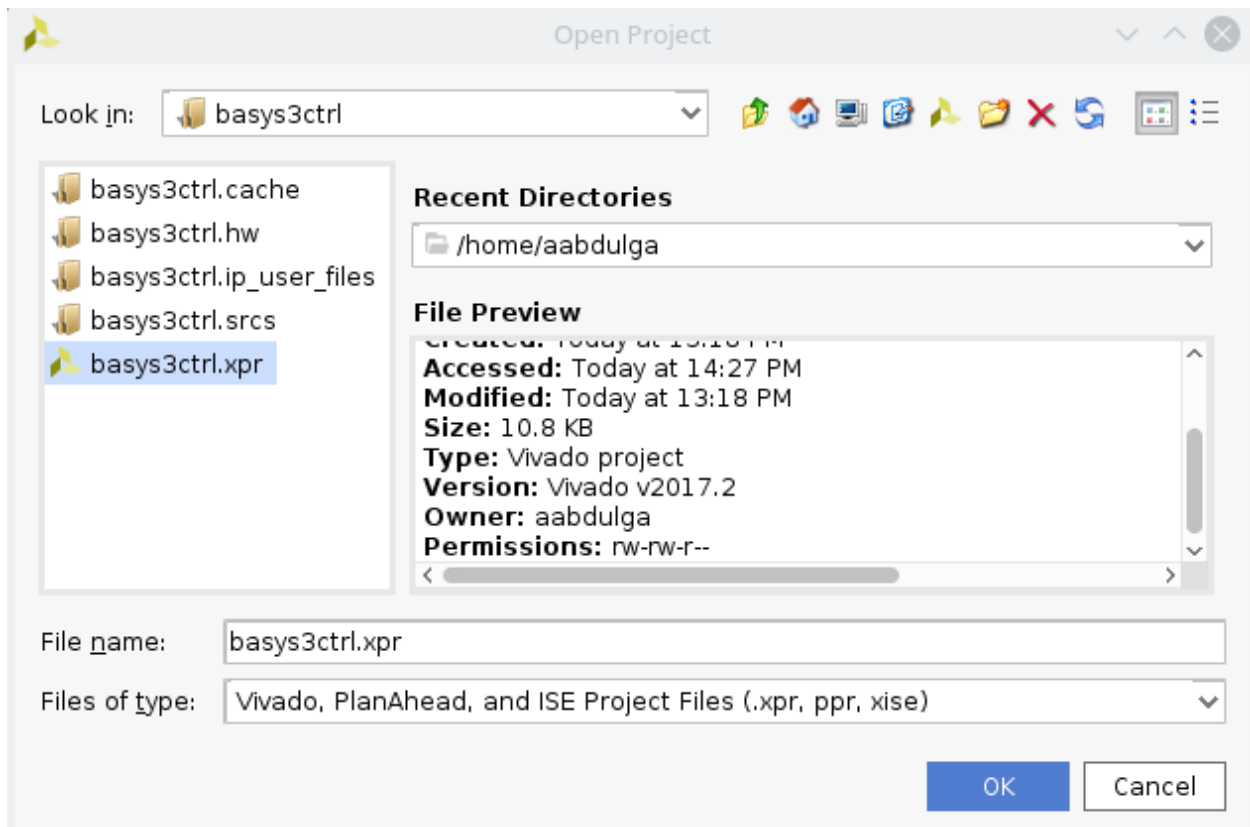


Fig. 1: Open Vivado project

3. In the Flow Navigator window, click 'Generate Bitstream'.
4. After bitstream is generated, click File > Export > Export Hardware ... make sure to select 'Include bitstream'.

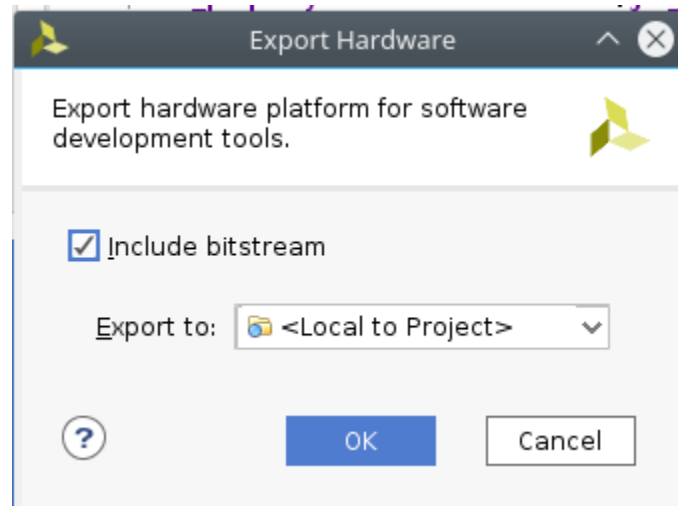


Fig. 2: Export Hardware

5. Launch the Xilinx SDK (File > Launch SDK).

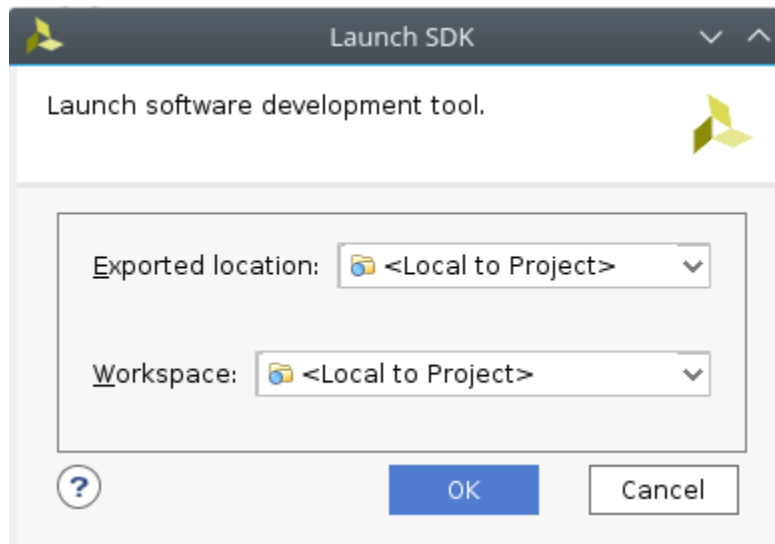


Fig. 3: Launch SDK

6. In the SDK, create a new empty project(File> New application project). You will need to select the hardware platform. SDK will create the BSP project from the hardware platform and create the empty project.
6. Link all the .c and .h files in the fobos/sources/basys3ctrl/sdk/src to the project (right-click on (project/src) -> Import -> General-> file system -> browse to file). make sure to check "Advanced-> Create links in the workspace" and "Create virtual folders" .
7. Right-click on the project you just created and select Build Configurations > Set Active > Release. Then right-click again and select Build Project.
8. Make sure that there are no debug flags. Right-click the release folder under the project and select Properties. In

Application Project
Create a managed make application project.

Project name:

☒ Use default location

Location:

Choose file system:

OS Platform:

Target Hardware

Hardware Platform:

Processor:

Target Software

Language: ☒ C ☐ C++

Compiler:

Hypervisor Guest:

Board Support Package: ☒ Create New

☐ Use existing

Fig. 4: Create Project

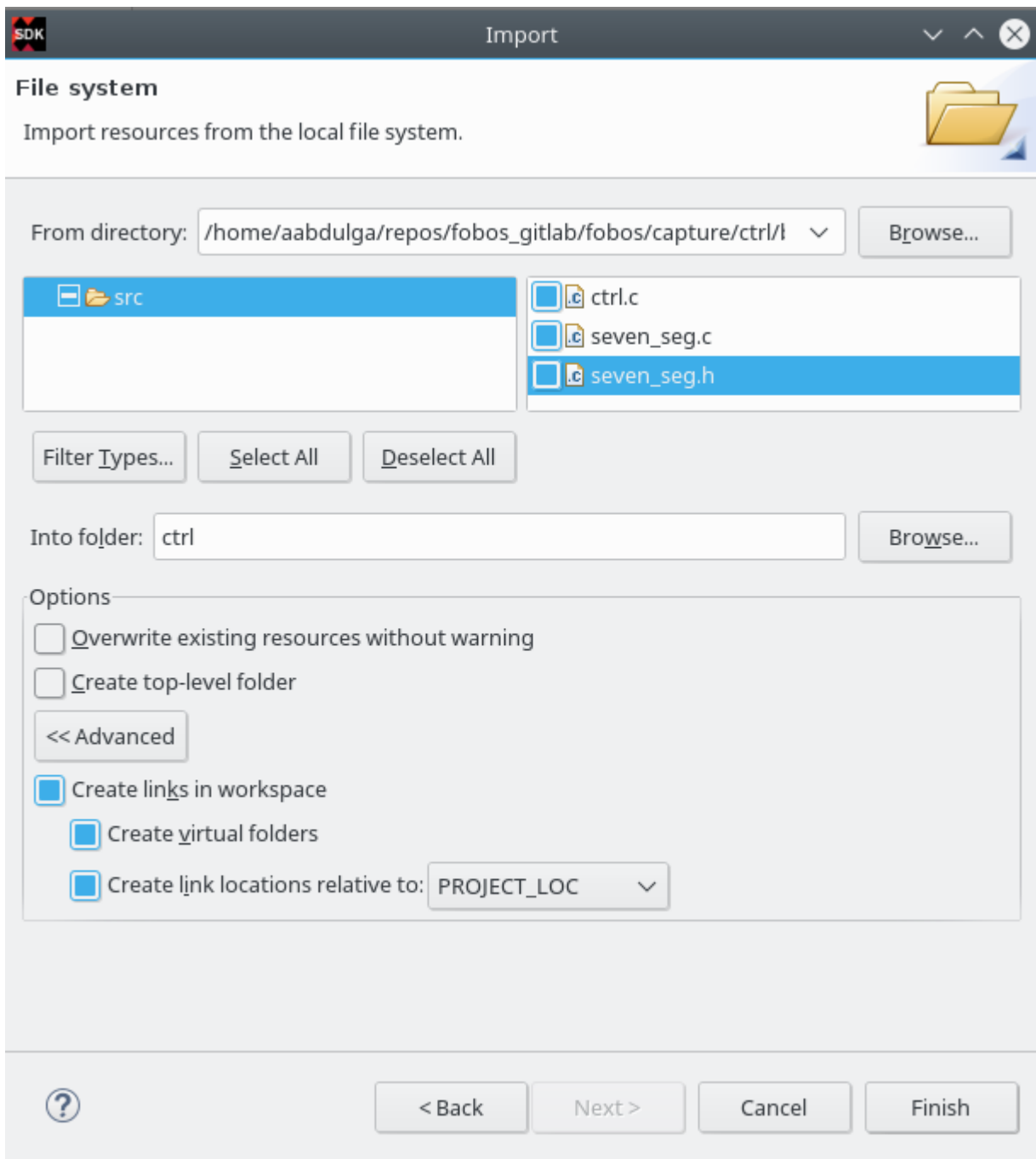


Fig. 5: Launch SDK

the window that appears select C/C++ Build > Settings > Microblaze gcc Compiler > Debugging and set Debug Level to 'None'.

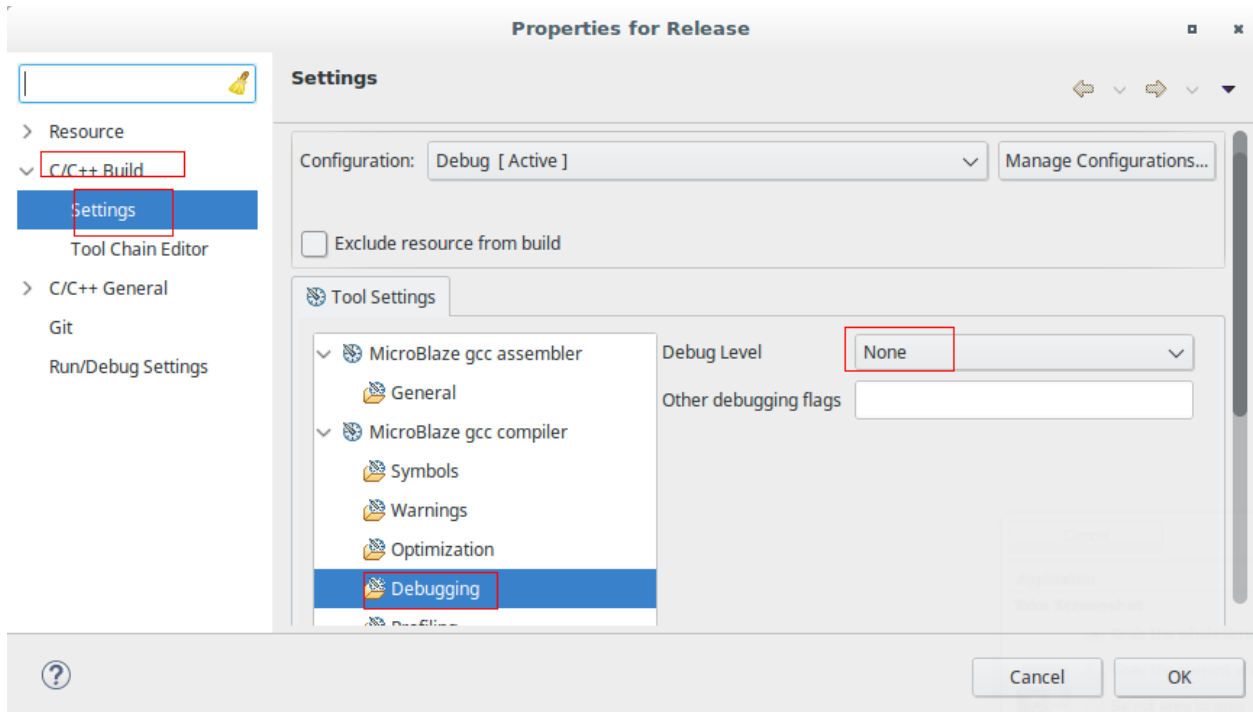


Fig. 6: Remove Debugging

INSTALLATION

3.1 The controller

To install FOBOS you need to download the package from: and run

```
$ setup fobos
```


INDICES AND TABLES

- `genindex`
- `modindex`
- `search`