Chapter 04 - OpenROAD first run - TRAINING - Advanced

Course authors (Git file)

1. Build an external example
2. Examine the results

“masked AES” from the HEP Alliance

Task: Clone the design

- Clone the masked AES design from Github.
- Use the tutorial from the HEP Alliance Repository:

https://github.com/HEP-Alliance/masked-aes-tapeout

- In a nutshell (clone via https):

```
1 git clone https://github.com/HEP-Alliance/masked-aes-tapeout.git <ORFS-Root>/flow/designs/ihp-sg13g2/masked_aes
```

Makefile

Task: Enable the design

- Navigate to the /flow folder
- Edit the Makefile:
  - Uncomment the line with your choosen DESIGN_CONFIG from ihp-sg13g2. In this case the cloned masked_aes:

```
1 DESIGN_CONFIG=./designs/ihp-sg13g2/masked_aes/config.mk
```

  - Re-comment the previous uncommented line with DESIGN_CONFIG.
  - The line with the default design does not need to be commented. This only applies when no previous line with DESIGN_CONFIG is set.

Run

Task: Run ORFS with the design

- Run `make` from inside the `/flow` folder.

Success

- The choosen design should finish after a while and a lot of console output with a table (time/memory) like this:

```
1 Log                    Elapsed seconds  Peak Memory/MB
```

CONGRATS! Your design got build to a GDS!

The flow steps

Task: Match the shell output

- Scroll the shell output from the command to the (successfull) end,
- Identify the flow steps in the shell output
- Try to match your findings to the flow steps and flow components from chapter 2
- Can you identify single open-source tools in the output of the flow? Name the ones you identified.

The GDS

Task: Examine the GDS

- See the GDS with the command `make gui_final`

Task: Save an image from the GDS

- In the TCL console at the bottom of the GUI:
  - save_image <imagename>.png
  - Find the saved image in your directories.